Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants

2011-2012 Data

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Summary

The Cal Poly Irrigation Training and Research Center (ITRC), in collaboration with academic, water district, and industry partners, proposes to evaluate new strategies for drip irrigation on strawberries to minimize runoff during transplant establishment.

The most common method used for irrigating strawberries is a mix of sprinkler irrigation and drip. Growers use sprinkler irrigation for bed preparation and salinity control, then eventually switch to drip irrigation after transplanting, but continue to use sprinkler irrigation as an insurance policy (for bonding between plant roots and soil bonding, washing off the leaves, controlling salinity, and frost). However, field observations have shown that only a small portion of the water applied by sprinklers actually infiltrates through the plastic mulch to the deeper plant roots.

The purpose of the project is to develop an analysis of the current irrigation practices of the strawberry growers on the Central Coast of California. The primary research evaluation period is during the establishment of transplants where sprinklers are typically used even though drip irrigation is available. Growers have been selected from Oxnard, Santa Maria, and Watsonville to provide a good cross section of the region's strawberry growing areas. The specific objectives of the project are to: (1) set up research areas and control plots on a demonstration scale, (2) determine the key factors that affect the problems in early growth of transplanted strawberries, (3) determine relationships between the use of irrigation water and the control of salinity, and (4) provide a multi-year analysis to determine long-term salinity impacts on yields. This project examines the motives, methods, and need for sprinklers on strawberries. The overall goal of the project is to conserve water by minimizing or eliminating sprinkler use on strawberries. The project is designed to study the current practice and determine the conditions where growers can change these practices. By minimizing sprinkler use, water is conserved, money is saved by pumping less water, and runoff is reduced. This project targets drought management as well as target runoff as a potential source of contaminants reaching waterways.

Preliminary results from the first 3 years of the project have provided several key conclusions:

- yields can be maintained
- water use can be decreased
- salinity is the key determinant in the transition to new irrigation management
- salinity comes from many sources

For the most current data included in this study, visit our website http://itrc.org/projects/JDWT/downloads.html. Underneath the "Summary Documents" heading, download the most current version of "Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants".

Introduction

For the past three growing seasons, the Cal Poly ITRC, has been conducting research on water use, salinity levels and various other information related to strawberries. This paper is a summary of work that can be found online at the ITRC website (www.itrc.org/projects.htm).

The project started in the fall of 2009 with a capacity issue on the Pumping Trough Pipeline (PTP), which is managed by the United Water Conservation District and supplies growers in the Oxnard area. At the time, strawberries growers would all plant during the same period in October (using sprinklers on the new transplants) and the demand created by sprinkler irrigation exceeded the pipeline's capacity. Faced with complaints of poor service, the district felt the best course of action was to regulate the use of sprinklers in October, and threatened to ban sprinkler irrigations for strawberry growers during that month. Local growers requested assistance to determine alternate irrigation methods. The simplest option was to use the drip irrigation system that is already installed when the transplants are brought to the field, but growers were concerned about the effects of salinity without sprinklers.

Objectives

The key objectives of the project are to:

- keep the strawberry transplants healthy
- switch to drip irrigation as soon as possible

Specifically, this involves the following steps:

1. Set up research areas and control plots on a demonstration scale
2. Determine the key factors that affect the problems in early growth of transplanted strawberries
3. Determine relationships between the use of irrigation water and the control of salinity
4. Provide a multi-year analysis to determine long-term salinity impacts on yields

Soil salinity, yield data, and water use on the strawberry fields during the first three years of the projects will be discussed in this paper.

Materials and Methods

Test Sites

This project consists of blocks of strawberry plants in fields across the Central Coast area of California (see Table 1). These test sites were selected to represent the areas of California where strawberries are commonly grown.

Table 1. Strawberry blocks used in study, followed by the irrigation method used

Santa Maria	Oxnard	Watsonville
Manzanita 2 Block I – 2-Tape Drip Only Block II – 2-Tape Drip Only Block A2 – 2-Tape Conventional Block A4 – 2-Tape Conventional Block B2 – 2-Tape Conventional Block B4 – 4-Tape Conventional Manzanita 7 Block A – 2-Tape Conventional Block B – 2-Tape Conventional Block I – Drip Only Block II – Drip Only Rice Block A – 4-Tape Partial Sprinkler Block B – 4-Tape Drip Only Main Block B – 4-Tape Reduced Sprinkler Block B – 4-Tape Reduced Sprinkler	Eclipse Block C – 4-Tape Reduced Sprinkler Block I – 4-Tape Conventional Block II – 4-Tape Conventional Donlon Block A – 4-Tape Partial Sprinkler Block B – 4-Tape Partial Sprinkler Sammis Block A – 4-Tape Drip Only Block B – 4-Tape Partial Sprinkler	Redman Block A – 2-Tape Drip Only Porter Block A – 2-Tape Drip Only Captainich Block A – 2-Tape Conventional Shultz Block A – 2-Tape Drip Only

Irrigation Methods to Evaluate:

The research evaluation identified three irrigation methods as test protocols:

1. Sprinkler Irrigation Only (SIP) – every day for up to 6 weeks, then switch to drip irrigation (this protocol is referred to as the "conventional" approach)
2. Partial Sprinkler Irrigation (PSI) – use sprinklers only for special cases for 3-8 irrigation events (e.g., right after transplanting, during hot dry wind events, frost protection) depending on extreme weather conditions such as the Santa Ana events
3. Drip Irrigation Only (DIO) – every day for the whole season

The key issue with the SIP conventional protocol is the amount of runoff generated during transplant establishment. Estimates range from 50-75% of the applied water will run off the field.

Flow Meters

Magnetic flow meters were chosen for the project as a flow measurement device due to their high reliability, ease of installation, and accuracy. A magnetic flow meter or "magmeter" has no moving parts and does not require the pipe to be full in order to make accurate measurements. It also has the ability to totalize flows and provide an accurate volumetric reading. This was a necessity as all water use numbers would need to be compared volumetrically. Also, magmeters are much less sensitive to turbulent flows than most other flow measurement devices. This allowed the meter to be installed in close proximity to elbows or valves, which made the installation very convenient. Both types of magnetic flow meters used are made by SeaMetrics and have a rated accuracy of ±1%.

Internet Monitoring –Ranch Systems and ClimateMinder

To simplify data acquisition, several growers implemented data monitoring systems from Ranch Systems, and ClimateMinder. These companies offer a variety of products to allow active monitoring of in-field conditions. Generally, this information can be posted on the internet in real-time. The theory was that not only would the data be logged, but valuable irrigation scheduling information would be readily available to the growers. The following paragraphs describe the process used to monitor data collected by Ranch Systems monitors; the ClimateMinder monitoring use a similar system.

Base Station

A crucial part of the Ranch Systems setup is a base station that relays all information collected by the nodes to the Ranch Systems network. This allows the information to be presented on the Ranch Systems website and accessed by users.

Nodes

Nodes are the devices that collect field sensor readings and transmit them to the base station. They consist of a solar panel, radio, and in this case soil and pressure sensors. Each node was connected to two Decagon 5TE soil moisture/temperature/Electrical Conductivity (EC) sensors and one Decagon PS1 pressure switch. The 5TE sensors were run down the strawberry bed and placed at a depth of 3" in each of the two middle plant rows. The PS1 pressure switch was connected using a brass T connection to a nearby sprinkler head in order to monitor the duration and frequency of sprinkler irrigations.

Data Collection

Collecting data from the Ranch Systems sensors requires simply accessing the Ranch Systems website, logging on and selecting the node of interest. However, this study found that the data from Ranch Systems was extremely unreliable and proved to be of little use. The sensors tended to fail and due to the complexity of the system, it was too difficult to repair/replace them.

Data Loggers

A traditional data logger was placed in each site of interest as a surefire way to constantly monitor field conditions.

Decagon Em50 data loggers were installed at every site at the Oxnard, Santa Maria, and Watsonville locations. These small data loggers were placed on the end of a block, near the middle row. Their compact size allowed them to be placed virtually anywhere in the field without the risk of damage from passing equipment. Each data logger was connected to two Decagon 5TE soil moisture/temperature/EC sensors and one Decagon PS1 pressure switch. The 5TE sensors were run down the strawberry bed and placed at a depth of 3" in the middle plant row. To monitor moisture and water movement in the root zone, additional 5TE sensors were installed at depths of 6 and 12 inches. The PS1 pressure switch was connected using a brass T connection to a nearby sprinkler head in order to monitor the duration and frequency of sprinkler irrigations.

Data Collection

Data collection consisted of simply visiting each site and downloading the logged data onto a laptop. This was done on a weekly basis during the period of transplant establishment. This allowed for frequent analysis of soil salinity levels during the most sensitive growth period. During the later stages of growth, data was collected on a bi-weekly basis as the strawberry plants are much more resistant to salinity during this period. Generally, the data loggers required little maintenance. About once per season, the batteries had to be changed and occasionally a 5TE sensor would fail. These sensors proved to be much more useful than the Ranch Systems data monitoring system.

Soil Sample Procedure

Periodically throughout the growing season, soil samples were taken in order to monitor the specific salt concentrations present in the soil. This was done by pulling samples from 0-3", 3-6", and 6-12" from the two middle plant rows. The EC and soil moisture content were also checked at each of the three depths using a handheld Decagon ProCheck device with a 5TE sensor. The samples were taken from near the center of the field close to where the 5TE data logger sensors were located. The locations of the samples vary somewhat between dates but for a given date, each sample was taken from the same spot in each field.

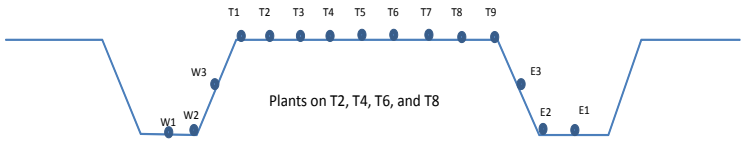
Salinity 5TE Shallow Analysis

In an attempt to track the movement of salts, EC measurements were taken across the top of the strawberry bed at a depth of 3 inches on numerous occasions throughout the growing season. This was done using a handheld Decagon ProCheck device with a 5TE sensor. Measurements were taken at the nine locations shown in Figure 1. These measurements were taken near the middle bed at both ends of each block. The locations of the measurements vary somewhat between dates, but for a given date, each measurement was taken from the same spot in each field.

Salinity Data - Top 3 inches
Sammis

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (18-Dec-10)

Sammis	West												East		
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E1	E2	E3
Salinity (dS/m)	7.0	6.1	12.8	5.7	5.9	7.1	3.5	13.6	6.3	4.4	5.0	11.4	17.5	3.7	8.0
Temp (F)	61	61	62	62	61	61	61	61	60	60	60	60	60	60	60
% Moisture	37	34	39	30	35	37	32	23	30	35	35	24	22	42	40

Block B - Partial Sprinkler (18-Dec-10)

Sammis	West												East		
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E1	E2	E3
Salinity (dS/m)	7.3	10.1	11.8	7.1	5.5	4.3	4.4	11.6	6.9	6.7	3.5	3.3	14.5	3.8	5.5
Temp (F)	59	60	60	60	60	60	60	60	60	60	60	60	60	60	60
% Moisture	44	39	22	30	30	29	36	25	34	40	35	35	28	41	48

Figure 1. Salinity 5TE Shallow Analysis, shows the salinity, temperature and percent moisture trends across strawberry beds

Water Sample Procedure
Water samples were taken whenever water was on the site. This gave some idea as to the quality of the irrigation water that was being used at each site. A waterproof total dissolved solids tester was used to test samples.

Photo Log Procedure
Pictures were taken of each test site during each visit (see Figure 2). This allowed the growth process of strawberries at each site to be monitored and later compared. All pictures were taken facing north from the location of the data logger in each field. One of the best methods to determine the health of the transplants during establishment has been the evaluation of the photos.

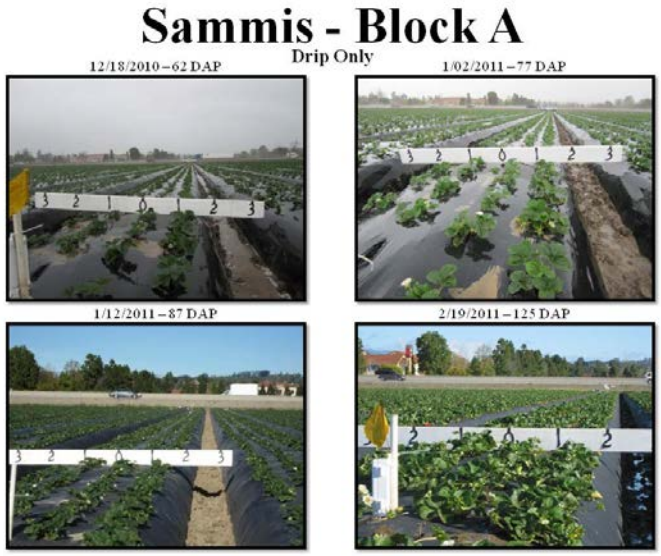


Figure 2. Photo comparison for Sammis Block A, shown by Days After Planting (DAP)

Santa Ana Wind Events
The "Santa Anas" are winds in Southern California that have speeds over 25 knots (28.6 mph) and can range to over twice that speed. Data for the events are monitored by the National Oceanic and Atmospheric Administration (NOAA). Santa Ana-type conditions are usually associated with hot, low humidity (around 10-20%). Figure 3(Tyree 2012) illustrates direction of air flow and Figure 4(Fisk 2008) shows the percent of time that Santa Ana conditions occur.

Figure 3. Diagram showing movement of Santa Ana winds from the Great Basin, down the Sierra Nevada Mountains into California, from California Nevada Applications Program website

When the Great Basin is much cooler than the Los Angeles Basin, typically from October to March, high pressure can build in the Great Basin. Around a high pressure system in the Northern Hemisphere, air flows clockwise. This causes the wind to flow from the Great Basin into the Los Angeles Basin, from the northeast and the east to the coast of California. Since the Great Basin is at a higher elevation than the Los Angeles Basin, when the air flows downward to the Los Angeles Basin it is heated adiabatically. In other words, when the air mass descends it is compressed and, therefore heated up at a rate of almost 30 degrees Fahrenheit per mile. When the air temperature rises, the relative humidity, in turn, decreases. This essentially creates "thirsty" air that will suck moisture from everything, including vegetation. The Santa Ana wind events happen at a crucial time for strawberry crops, the transplant stage. Extra attention must be paid to water application when these winds are blowing as they can take a large amount of moisture out of the plants and cause detrimental damage.

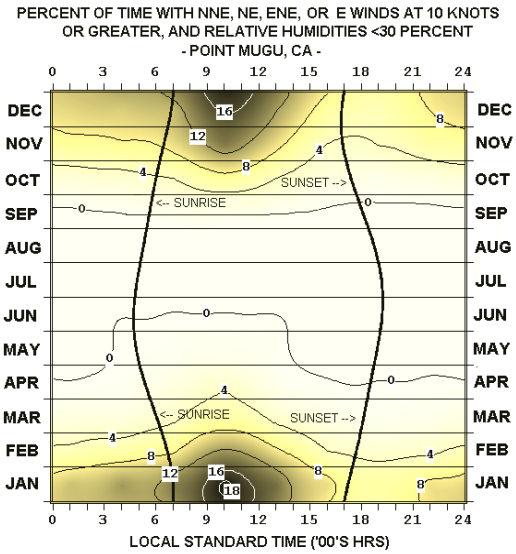


Figure 4. Graph from NOAA: "Two-way" Climatological Time-Section Plot from Charles Fisk – Meteorologist

Results and Discussion

Soil Salinity Continuous Data

All continuous data was obtained from the Decagon data loggers rather than the Ranch Systems monitoring system. The Ranch Systems nodes and sensors proved unreliable early in the season and were quickly abandoned. Similar problems occurred occasionally with the Decagon data loggers, but were much less frequent.

The resulting data was highly variable between all of the test plots. This made a statistical analysis of the salinity data infeasible. Clearly there is a tremendous amount of uncertainty associated with managing salinity. Additionally, the charts clearly show the huge effect that rainfall has on salinity. The data showed that a heavy rain in January lowered salinity levels by up to 50% while sprinkler irrigation events had much less impact on the soil salinity. This was primarily due to the fact that the rainwater has a low pH value and no salt content.

From the soil salinity data collected, salinity contours graphs were made (shown in Figure 5). The graphs display values of salinity (dS/m) in the plant beds. These are useful to the grower for analyzing where the salt is pushed by applied water. Darkest grey color signifies EC values of 10 dS/m or higher, which is considered toxic to the plant if not leached.

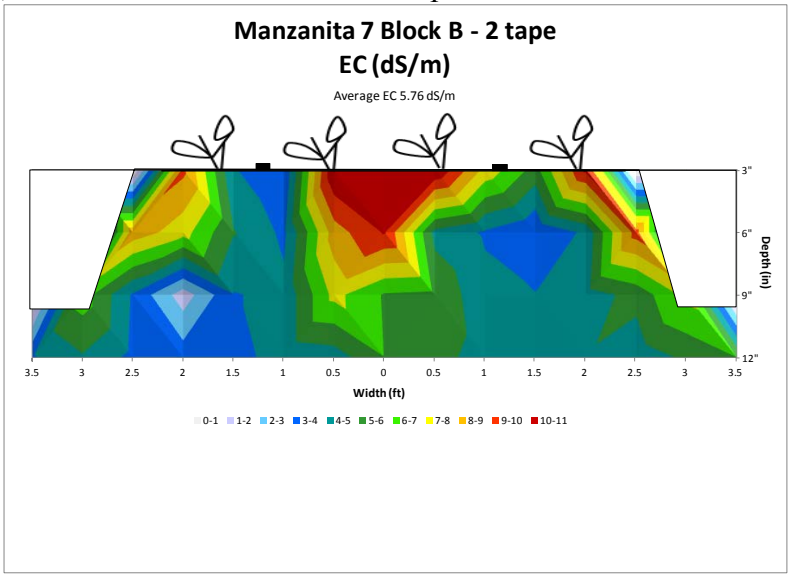


Figure 5 Contour graph of salinity (dS/m) in Manzanita 7 block

Rainfall Data

The data from the sensors was uploaded to a spreadsheet. This spreadsheet contains data from the entire study, displaying salinity levels in both water and soil. It also contains precipitation data, as well as number of minutes the sprinklers were running. All of the data was collected from the fields except for the precipitation data. The precipitation data was obtained from California Irrigation Management Information System (CIMIS 2012) or the Weather Underground websites (Weather Underground 2012) using the nearest airports as the location. After all of the data was uploaded into the spreadsheet, graphs were made to visually monitor the salinity levels.

The salinity levels displayed in the graph (Figure 6) showed some common trends. The salinity levels fluctuated daily. There were noticeable drops in the salinity level after periods of rain. This would indicate local leaching had occurred near the sensors. Then the salinity levels would begin to rise after the rain subsided. However, this held true for the sensors only in the 0"-3" range. The sensors deeper than that did not record as prominent of a fluctuation. This would indicate there was not a lot of downward movement of the irrigation water.

INSERT SAMMIS Block A 2010-2011 season
Figure 6 Sample salinity graph from Sammis Block A, salinity is measured at 3, 6 and 12 inch depths

Water Use Data
Throughout the season, the water use at the sites is monitored by meter readings taken periodically. The trends can be viewed over several seasons. We have found that the total water is around the same each year (shown in figure 7). The total water seems to be decreasing over the span of the study, but it must be noted that with the weather conditions, every year is different. More data must be collected to incorporate conclusions.
INSERT yield data
Figure 7 Yield data from Sammis for three seasons (2009-2011)

Impact on Yields

The yields in the first season showed little impact due to the irrigation method. However, in the first season there was noticeable damage to plants where the salinity levels were very high due to the placement of the drip irrigation tape. The conclusion was that even though there was some die-off, the other plants seemed to respond better, which kept the yields about equal to previous years. The other conclusion was that the placement of the drip tape was important.

The second season yields were higher with the new irrigation protocol. The yield increase in Manzanita was 13% on the partial sprinkler protocol compared to the conventional protocol. The grower also reported the yields on the partial sprinkler protocol resulted in early field gains at a time when the market prices were favorable.

The data from Sammis in 2009-2010 also indicated that the yields improved using the new irrigation methods. The partial sprinkler protocol had an 8% increase in yield and the drip only protocol had a 13% increase in yield.

The third year of data has seen a dramatic drop-off in the data collection of yields by the early innovators. These growers have switched their whole fields over to the new protocol and have abandoned the "conventional" irrigation approach. The exception is the Sammis field managed by Reiter Affiliated Companies (RAC). Figure 8 shows a side-by-side comparison of the partial sprinkler and drip only protocols for 3 years.

Several preliminary conclusions can be drawn from the graphs used in the evaluation (examples shown in Figures 5-8):

- Yields fluctuate on a year-to-year basis based on numerous factors. The overall weather seems to be a major determinant on yields. The first year of the project the rainfall was less abundant. The third year had three times more rainfall than the first. The hotter, dryer weather may have led to better yields in the first year. Keep in mind that the first year on the drip only saw a 30% die-off due to salinity damage.
- For two of the years, the drip only protocol resulted in higher yields at the 120 days after planting mark. This is significant since several of the growers have noticed higher yields early in the season, when prices tend to be higher.
- The Sammis grower has abandoned the conventional irrigation protocol. The first year results convinced this early adopter that the new protocol would be beneficial to his operations.

Lessons Learned

The study is still at the beginning stages so the conclusions are based on limited information. The results from the first year (2008-2009) were mixed due to some major die-off issues (up to 30% in one demonstration plot). The first year seemed to be dominated by low rainfall and numerous Santa Ana wind events. While generally unsuccessful in terms of results, the grower wanted to continue the study since the potential seemed promising, and there were numerous key lessons learned.

The second year had some incredible results for increases in yield and decreases in water use. There were decreases in water use of up to 10% and a surprising increase in yields was reported.

The third year has been one where the focus has shifted to more of the details. For example, is 4-tape better than 2-tape? If 2-tape will work, what are the soil texture characteristics that will allow that to happen? There are some key items that we are seeing as we approach the end of the third year:

- Salinity is a key determinant in the healthy establishment of the strawberry transplants. The young plants will not tolerate high levels of salts. The damage in the plants will appear similar to a plant that lacks sufficient water.
- Row crop drip tape must be placed correctly in order to micro-leach salts in the beds. This means that in the Oxnard Plain, growers **may** need to use four low flow tapes in order to successfully switch to the drip only or partial sprinkler protocols. Growers in Santa Maria might be able to use only two tapes per bed (on lighter soils) but the salinity must be evaluated in order to make sure the salts are not building up at the base of the plant. Using three tapes is **NOT** recommended on beds with four plant rows. However, it is being done on a number of ranches.
- Monitoring the salinity of the soil and the irrigation water will help growers switch from the conventional irrigation method to a new protocol. The soil salinity should be less than 7 dS/m (EC_e) and the water salinity should be less than 1.0 dS/m (EC_w). Monitoring can be done with portable measurement equipment but should be verified using professional soil labs.

- The irrigation water is one of the key determinants of whether there may be a problem. If the water quality is 1.0 dS/m or less, the impact is minimal. If the salinity of the irrigation supply water is 1.2 dS/m, the grower could see a 10-25% yield impact. It should be noted that well water, surface water, and reclaimed water sources have changing salinity characteristics during the season.
- Salts come from various sources. Some sources of salt include the irrigation water, gypsum applications, fertilizers (both pre-plant and liquid), and composting (which can be a significant source).
- Traditional salinity references have used soil salinity as the key determinant for the salt impact on yields. The traditional approach states that if the soil salinity (EC_e) approaches 4.0 dS/m the yield will be 100% impacted (i.e., no yield). However, this research confirmed most growers in the Oxnard Plain routinely work in soils at 4-6 dS/m with very little impact on yields. The reason is that they have been managing their salts properly near the roots of the young plants.
- Soils that are lighter will be easier to irrigate and manage than soils that are heavy. This has been observed in the various plots as part of this research.
- Rain washes salts away from young strawberry transplants. The data clearly show that rainwater (which is essentially salt-free and acidic) can push harmful salts away from the plants. The data show how dramatically the salinity level dropped after the rain.
- The new protocols result in a yield increase up to 10%. The new protocols have also decreased the water use by over 10%. This research project has shown that the new approach has resulted in ***more crops per drop***.

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Oxnard/Camarillo Blocks 2011-2012

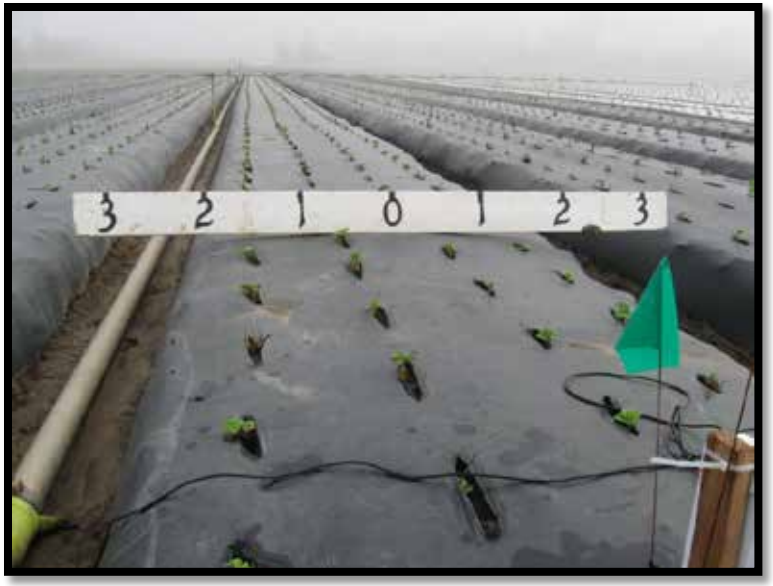
Sammis

Sammis - Block A

Reduced Sprinkler

10/7/2011 – 2 DAP

10/22/2011 – 15 DAP



11/5/2011 – 29 DAP

11/27/2011 – 51 DAP

Sammis - Block A

Reduced Sprinkler

12/16/2011 – 70 DAP

1/12/2012 – 97 DAP

2/03/2012 – 119 DAP

2/21/2012 – 137 DAP

Sammis - Block A

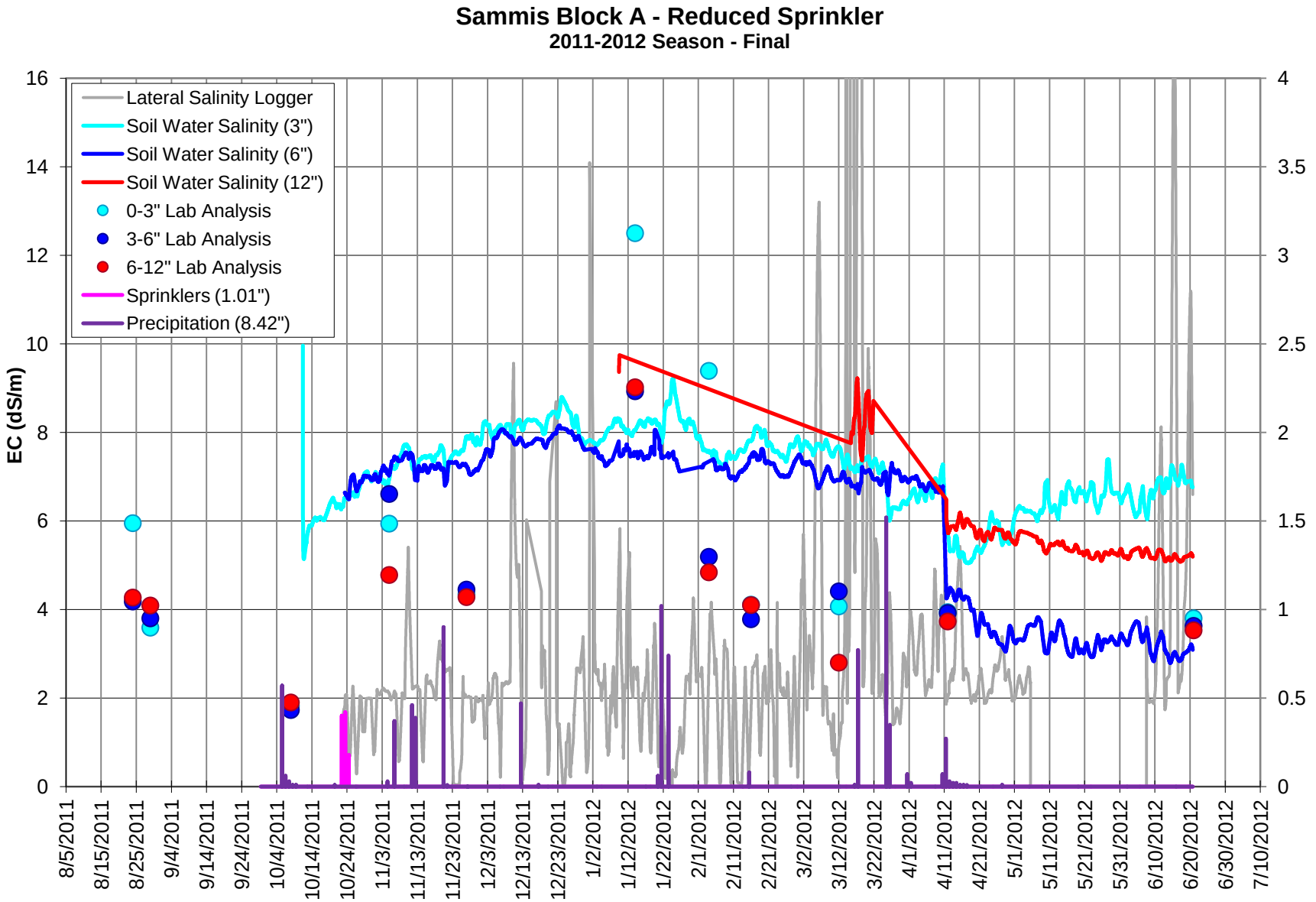
Reduced Sprinkler

3/12/2012 – 157 DAP

4/10/2012 – 186 DAP

5/4/2012 – 261 DAP

6/20/2012 – 308 DAP


Sammis Block A - Reduced Sprinkler
2011-2012 Season - Final
Lateral Salinity Logger
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (1.01")
Precipitation (8.42")
EC (dS/m)
16
14
12
10
8
6
4
2
0
4
3.5
3
2.5
2
1.5
1
0.5
0
8/5/2011
8/15/2011
8/25/2011
9/4/2011
9/14/2011
9/24/2011
10/4/2011
10/14/2011
10/24/2011
11/3/2011
11/13/2011
11/23/2011
12/3/2011
12/13/2011
12/23/2011
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2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012

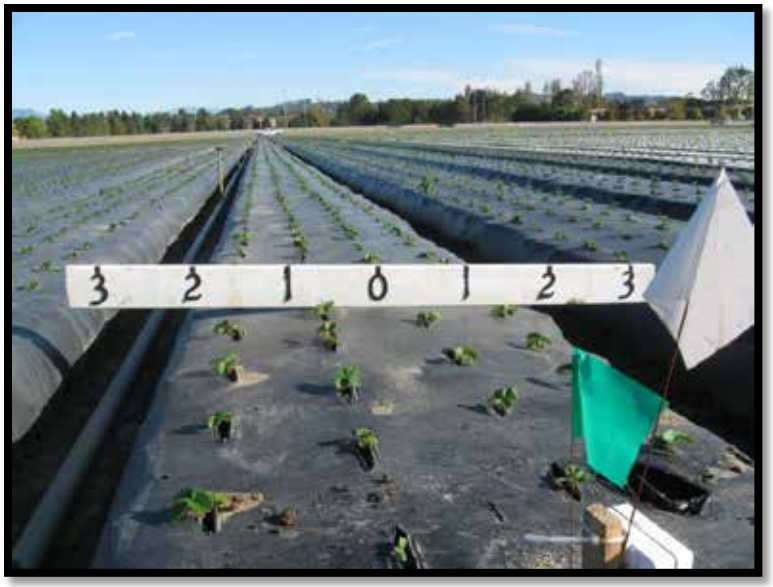
Sammis - Block B

Conventional

10/7/2011 – 2 DAP

10/22/2011 – 15 DAP

11/5/2011 – 29 DAP



11/27/2011 – 51 DAP

Sammis - Block B

Conventional

12/16/2011 –70 DAP

1/12/2012 – 97 DAP

2/03/2012 – 119 DAP

2/21/2012 – 137 DAP

Sammis - Block B

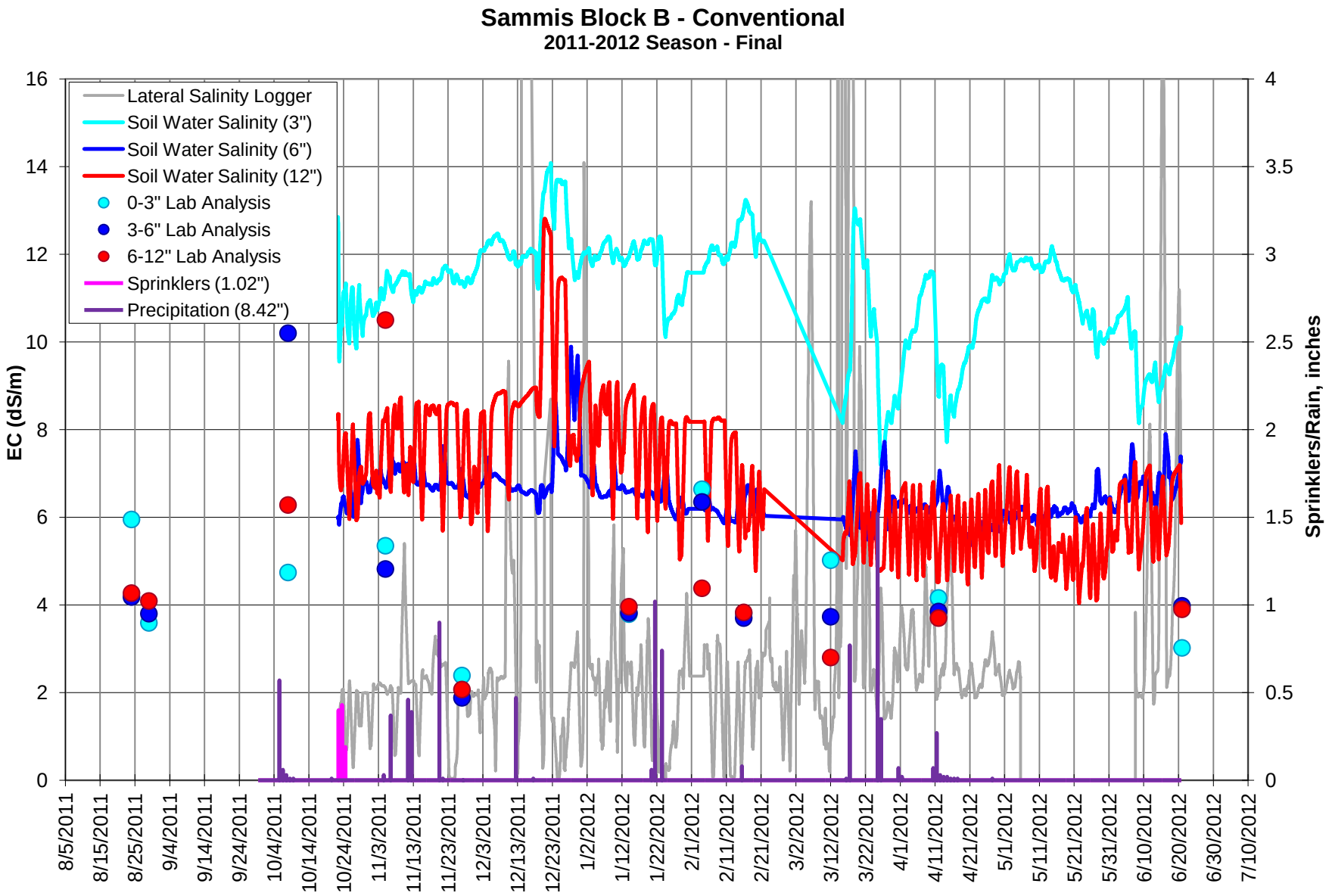
Conventional

3/12/2012 –157 DAP

4/10/2012 –186 DAP

5/4/2012 –261 DAP

6/20/2012 –308 DAP


Sammis Block B - Conventional
2011-2012 Season - Final
Lateral Salinity Logger
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (1.02")
Precipitation (8.42")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
8/5/2011
8/15/2011
8/25/2011
9/4/2011
9/14/2011
9/24/2011
10/4/2011
10/14/2011
10/24/2011
11/3/2011
11/13/2011
11/23/2011
12/3/2011
12/13/2011
12/23/2011
1/2/2012
1/12/2012
1/22/2012
2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012

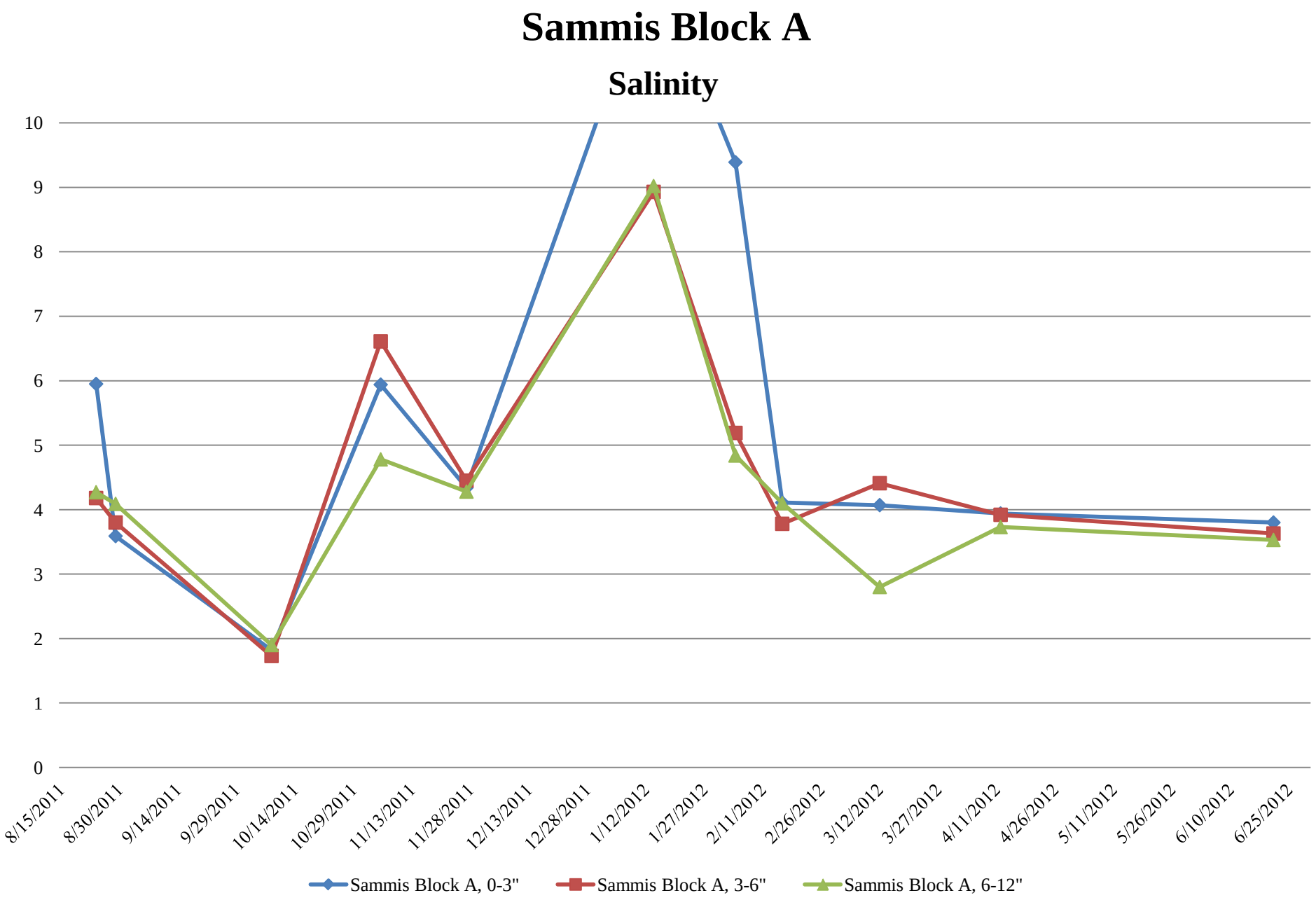
Evaluation of Modified Drip Irrigation Strategies on Strawberries - Sammis Blocks

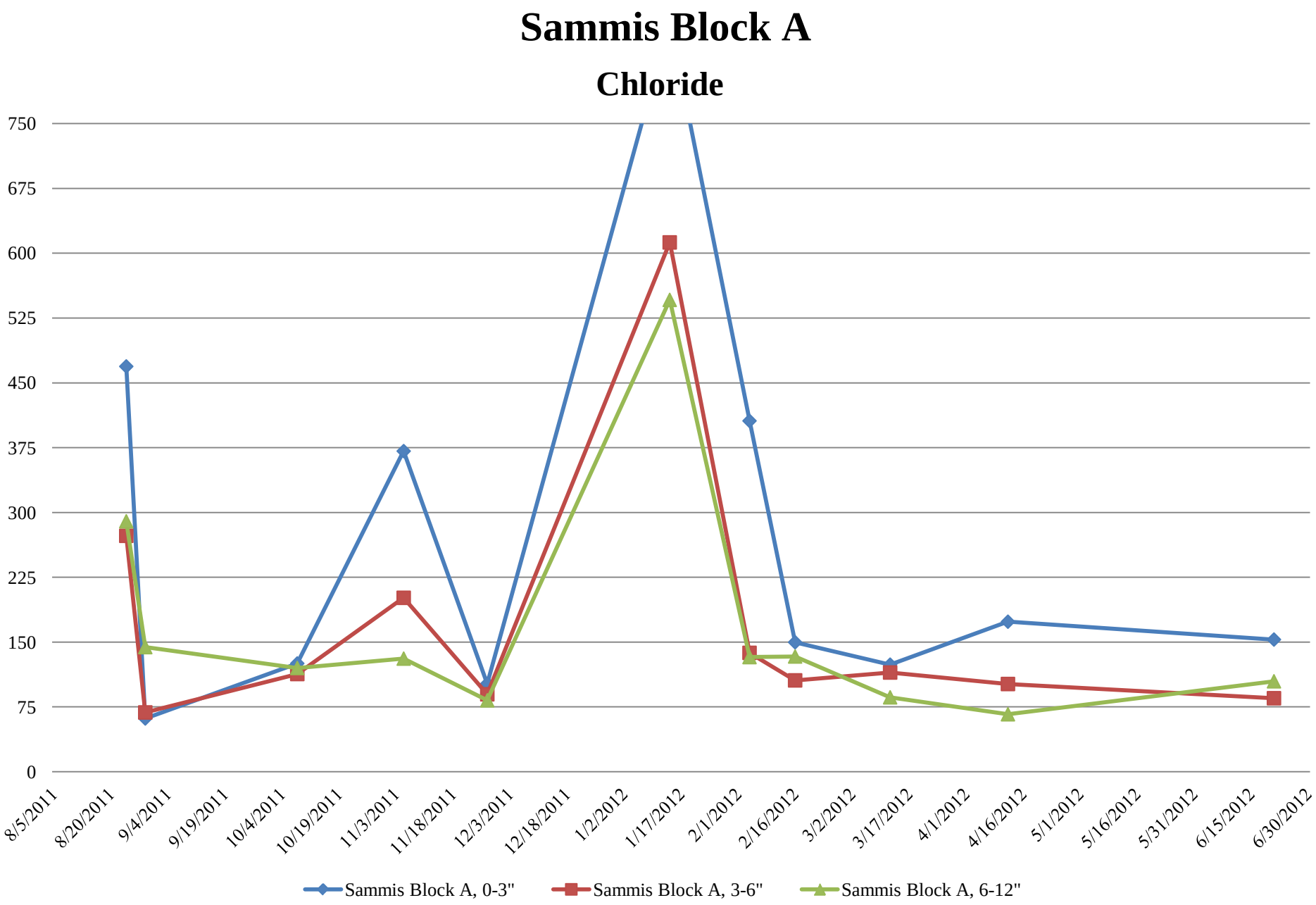
Date:		8/24/2011 Pre-Irrigation			8/29/2011 Pre-Plant			10/8/2011			11/5/2011			11/27/2011		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	5.95	469.00	DLS	3.59	61.60	DLS	1.82	125.30	DLS	5.94	371.00	DLS	4.34	101.85
	3-6"	DLS	4.18	273.00	DLS	3.80	68.60	DLS	1.73	113.05	DLS	6.61	201.25	DLS	4.45	89.60
	6-12"	DLS	4.27	289.80	DLS	4.09	144.20	DLS	1.90	120.05	DLS	4.78	130.90	DLS	4.28	82.60
Block B	0-3"	SSS	5.95	469.00	SSS	3.59	61.60	SSS	4.74	344.40	SSS	5.35	423.50	SSS	2.39	103.25
	3-6"	SSS	4.18	273.00	SSS	3.80	68.60	SSS	10.20	222.60	SSS	4.82	310.10	SSS	1.88	65.45
	6-12"	SSS	4.27	289.80	SSS	4.09	144.20	SSS	6.28	149.10	SSS	10.50	142.10	SSS	2.07	80.85

Date:		1/4/2012			2/4/2012			2/16/2012			3/12/2012			4/12/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	12.50	868.00	DLS	9.39	406.00	DLS	4.11	149.80	DLS	4.07	123.90	DLS	3.94	173.60
	3-6"	DLS	8.93	612.50	DLS	5.19	137.55	DLS	3.78	105.70	DLS	4.41	114.80	DLS	3.92	101.50
	6-12"	DLS	9.02	546.00	DLS	4.84	132.65	DLS	4.10	133.35	DLS	2.80	86.10	DLS	3.73	66.50
Block B	0-3"	SSS	3.79	97.65	SSS	6.64	469.00	SSS	3.80	99.40	SSS	5.02	381.50	SSS	4.16	220.50
	3-6"	SSS	3.82	99.75	SSS	6.35	125.65	SSS	3.70	91.00	SSS	3.73	166.60	SSS	3.85	119.00
	6-12"	SSS	3.96	108.15	SSS	4.38	100.80	SSS	3.83	92.75	SSS	3.99	148.40	SSS	3.70	90.30

Date:		6/21/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	3.80	152.95
	3-6"	DLS	3.63	85.05
	6-12"	DLS	3.53	104.65
Block B	0-3"	SSS	3.02	145.60
	3-6"	SSS	3.98	107.45
	6-12"	SSS	3.90	74.55

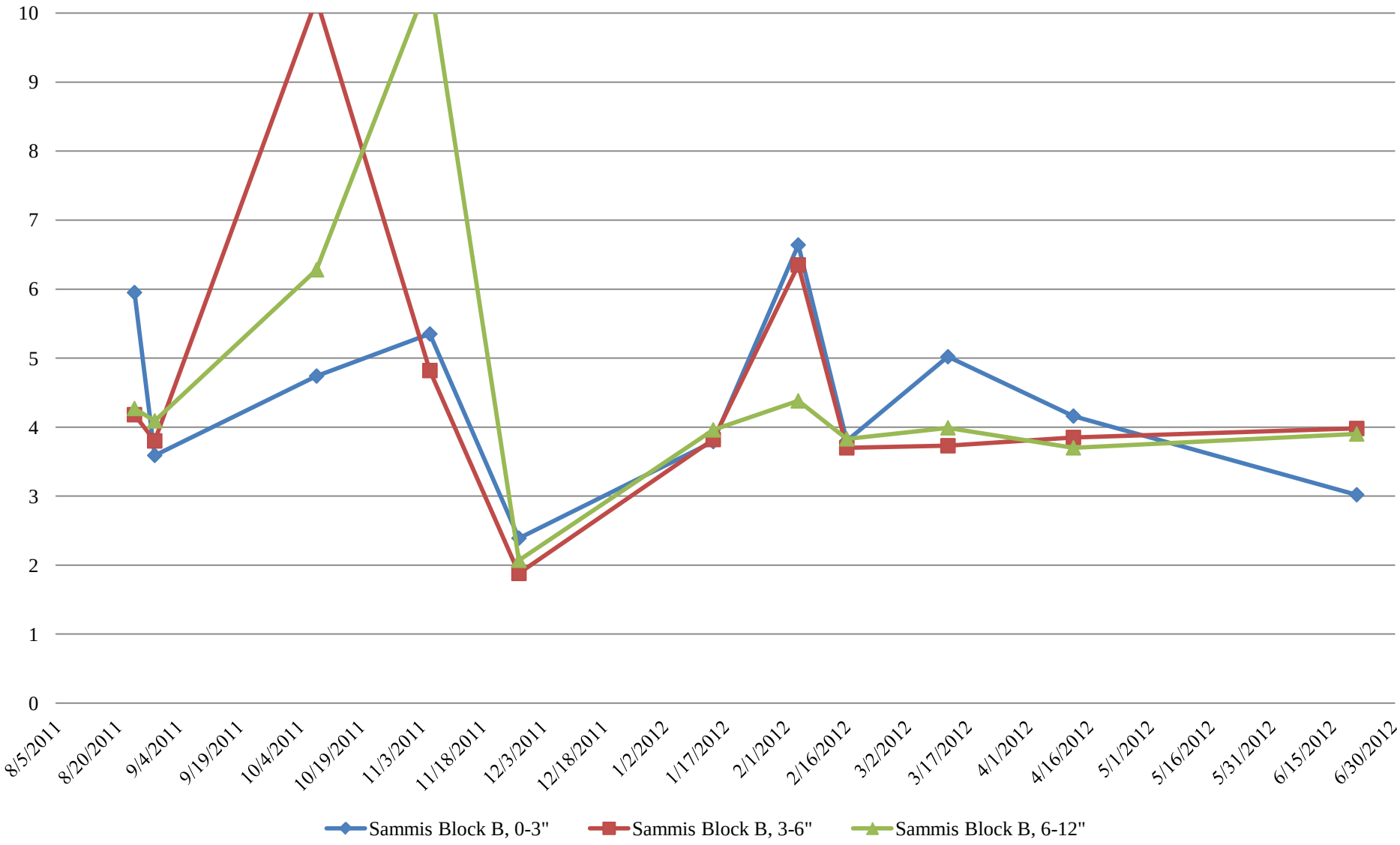
Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler


Sammis Block A
Salinity
10
9
8
7
6
5
4
3
2
1
0
8/15/2011
8/30/2011
9/14/2011
9/29/2011
10/14/2011
10/29/2011
11/13/2011
11/28/2011
12/13/2011
12/28/2011
1/12/2012
1/27/2012
2/11/2012
2/26/2012
3/12/2012
3/27/2012
4/11/2012
4/26/2012
5/11/2012
5/26/2012
6/10/2012
6/25/2012
Sammis Block A, 0-3"
Sammis Block A, 3-6"
Sammis Block A, 6-12"


Sammis Block A
Chloride
750
675
600
525
450
375
300
225
150
75
0
8/5/2011
8/20/2011
9/4/2011
9/19/2011
10/4/2011
10/19/2011
11/3/2011
11/18/2011
12/3/2011
12/18/2011
1/2/2012
1/17/2012
2/1/2012
2/16/2012
3/2/2012
3/17/2012
4/1/2012
4/16/2012
5/1/2012
5/16/2012
5/31/2012
6/15/2012
6/30/2012
Sammis Block A, 0-3"
Sammis Block A, 3-6"
Sammis Block A, 6-12"

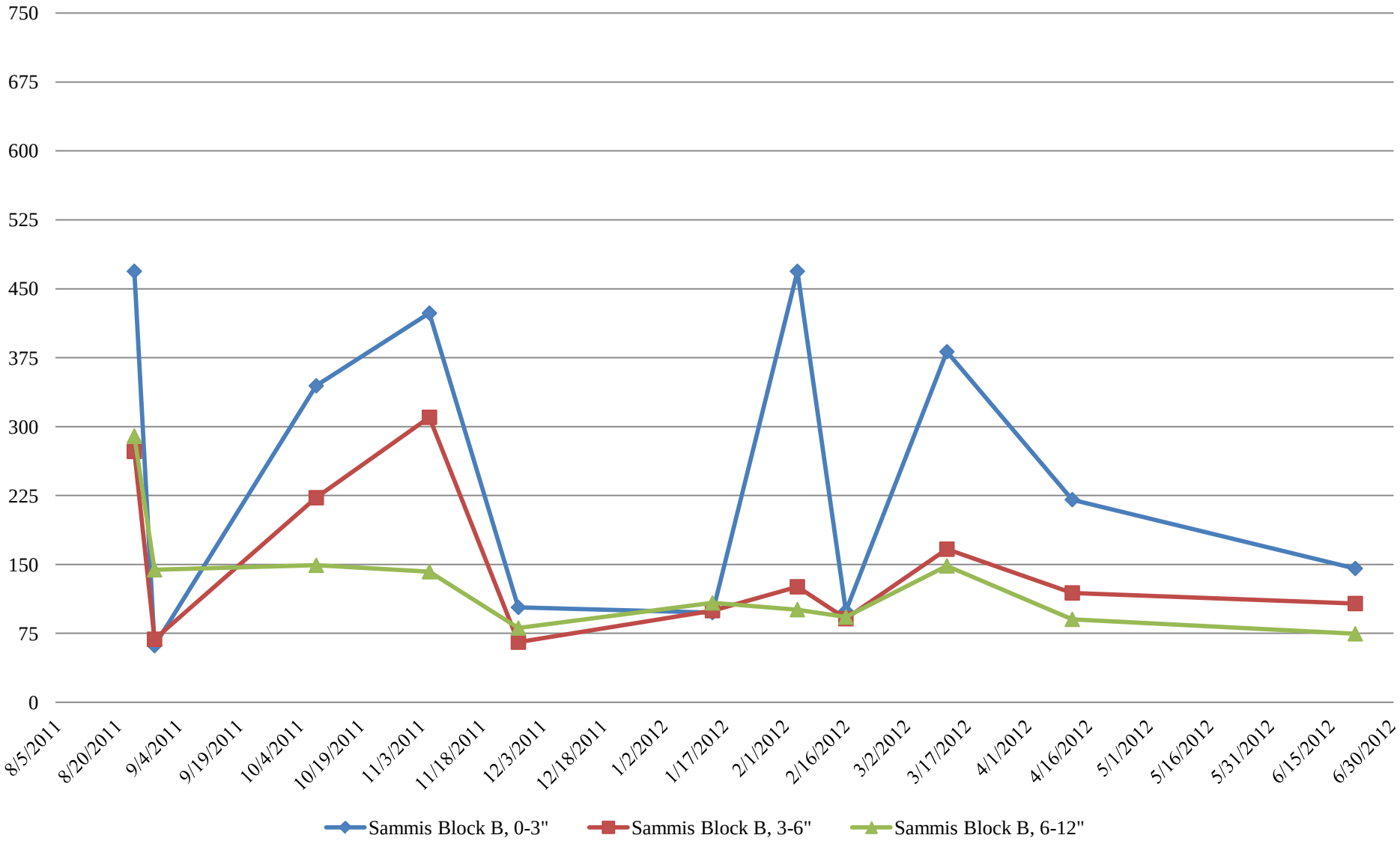
Sammis Block B

Salinity



Sammis Block B

Chloride



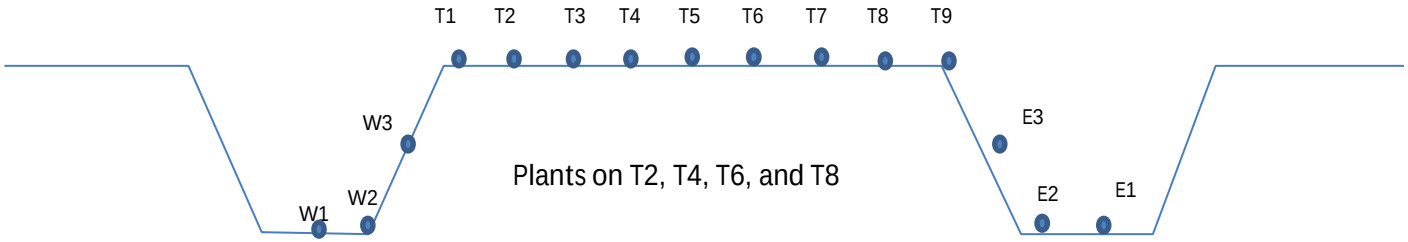
Salinity Data - Top 3 inches

Sammis (RAC)

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (07-Oct-11)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	20.1	16.0	15.4	5.2	6.8	13.9	7.8	9.7	7.1	5.7	5.3	6.1	8.4	6.4	7.0
% Moisture	24.0	23.0	21.5	18.2	20.1	24.5	22.7	24.0	23.0	23.8	22.2	18.4	30.0	34.0	18.1

Block B - Partial Sprinkler (07-Oct-11)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	10.1	4.1	9.3	5.6	2.6	6.6	4.0	8.1	7.5	14.0	16.4	8.1	7.2	5.9	1.0
% Moisture	38.0	35.0	26.0	17.0	19.0	26.0	22.0	29.0	22.5	21.0	18.6	18.0	40.0	37.0	24.2

Block A - Drip Only (22-Oct-11)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	7.6	9.8	10.3	10.6	3.5	6.3	7.3	3.4	7.4	5.4	8.0	6.3	13.4	8.0	7.5
Temp(F)	60.6	61.3	61.7	61.2	61.0	61.2	61.5	61.7	61.5	61.7	61.7	61.3	60.8	60.8	61.2
% Moisture	21.6	30.8	24.5	21.1	23.9	26.3	24.3	20.2	20.4	20.4	22.2	26.7	29.6	32.7	28.5

Block B - Drip Only (22-Oct-11)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	7.1	7.5	3.1	10.8	11.4	8.6	12.3	9.5	11.1	7.6	4.0	11.8	9.9	4.9	12.3
Temp(F)	62.4	62.4	62.4	62.6	62.4	62.4	62.6	62.6	62.8	6.8	62.2	61.8	61.7	60.8	60.3
% Moisture	32.6	30.4	24.1	25.3	24.4	26.6	22.1	23.6	22.7	31.6	27.5	28.5	32.0	31.6	28.6

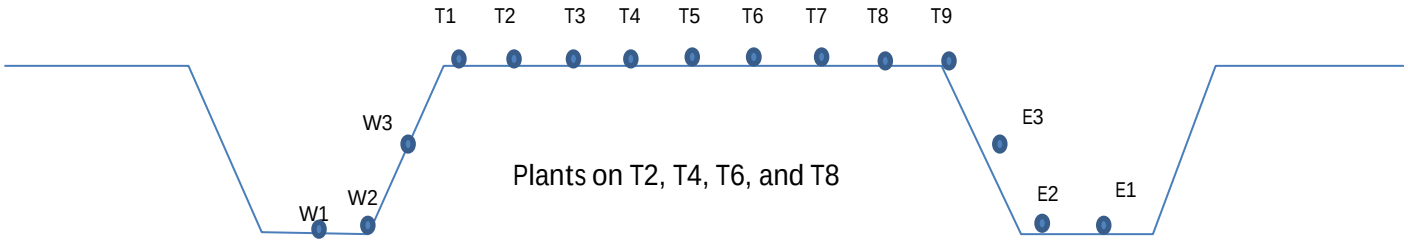
Salinity Data - Top 3 inches

Sammis (RAC)

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (05-Nov-11)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	7.4	2.5	11.0	4.5	6.2	6.3	11.5	10.8	6.0	7.0	8.8	6.9	9.4	8.0	8.5
Temp(F)	55.2	45.1	24.1	53.1	52.5	52.7	53.1	53.4	53.8	54.1	54.5	54.5	56.3	57.2	56.3
% Moisture	28.7	28.1	22.2	22.7	22.4	27.3	25.0	24.1	26.7	24.3	24.3	21.3	27.7	29.4	28.3

Block B - Drip Only (05-Nov-11)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	2.8	11.3	6.6	8.2	8.9	6.1	4.7	11.0	9.4	6.2	5.1	9.9	11.9	6.6	7.3
Temp(F)	53.2	52.7	52.2	51.6	51.2	51.1	51.4	51.8	51.8	51.6	51.4	51.1	52.9	53.2	45.3
% Moisture	23.4	24.7	24.7	27.2	27.3	33.3	26.4	27.5	27.5	32.9	37.6	27.9	27.8	31.8	31.3

Block A - Drip Only (27-Nov-11)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	7.4	5.8	6.6	5.5	2.2	6.3	4.1	6.9	4.5	5.9	5.7	1.4	5.6	6.8	3.5
Temp(F)	65.7	64.6	6.3	52.2	61.7	61.0	59.9	59.0	58.3	57.7	57.7	57.3	58.3	58.3	57.9
% Moisture	14.3	33.2	24.1	16.7	22.8	36.2	30.7	28.9	28.9	27.8	27.6	21.6	34.0	30.7	19.2

Block B - Drip Only (27-Nov-11)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	4.0	7.6	9.1	11.4	8.5	4.4	8.3	8.1	6.5	5.6	6.9	7.0	8.1	4.6	4.8
Temp(F)	7.6	56.7	56.5	55.3	55.0	55.6	55.6	55.4	55.0	54.7	54.0	54.0	54.3	54.5	54.9
% Moisture	23.1	28.7	30.1	26.0	33.2	37.3	28.2	30.1	28.2	37.1	34.5	26.3	34.5	34.5	24.7

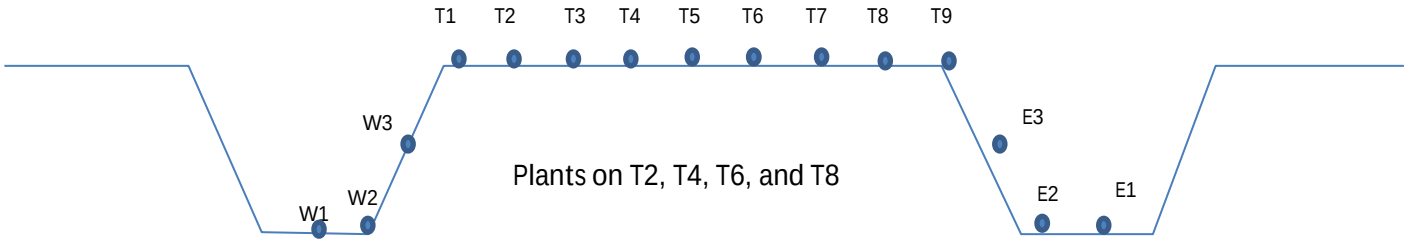
Salinity Data - Top 3 inches

Sammis (RAC)

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (16-Dec-11)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	9.3	8.3	2.8	9.1	9.1	8.9	12.0	11.9	8.0	9.9	6.2	10.4	12.5	9.7	4.3
Temp(F)	54.7	53.1	52.2	51.4	50.9	50.7	50.7	50.5	50.7	50.5	50.5	50.7	52.3	52.7	52.3
% Moisture	23.6	25.3	24.2	25.5	24.9	32.5	25.8	24.2	21.3	28.7	21.7	20.8	22.4	26.2	18.6

Block B - Drip Only (16-Dec-11)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	8.7	13.6	13.2	6.7	8.9	9.2	10.2	15.5	11.6	11.9	10.4	12.8	8.5	11.1	12.0
Temp(F)	49.5	49.1	49.1	49.3	49.2	49.5	48.9	30.9	50.9	51.5	51.1	52.0	52.7	54.0	53.2
% Moisture	24.3	24.1	23.0	24.4	24.4	25.5	24.6	23.6	24.9	25.4	21.8	25.2	22.5	29.7	26.9

Block A - Drip Only (8-Jan-12)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.9	11.9	10.3	8.8	3.6	12.0	13.9	12.6	9.1	5.0	7.1	8.2	9.0	12.9	12.4
Temp(F)	58.1	57.9	57.9	9.9	58.8	57.6	55.6	54.1	34.1	53.8	53.2	53.4	55.4	53.4	53.6
% Moisture	18.6	23.9	25.8	18.9	22.6	28.0	20.8	23.8	26.0	27.0	24.0	27.0	22.4	26.4	16.7

Block B - Drip Only (8-Jan-12)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	7.3	2.6	9.8	11.9	7.8	8.2	5.9	13.5	9.7	9.7	11.9	14.6	12.5	9.2	10.2
Temp(F)	55.4	55.9	56.7	58.3	59.0	59.0	58.6	58.1	55.8	55.8	56.0	56.3	56.7	56.8	56.3
% Moisture	23.7	25.7	27.9	27.6	27.5	33.4	22.3	24.0	25.9	32.7	25.4	25.8	22.2	30.9	23.4

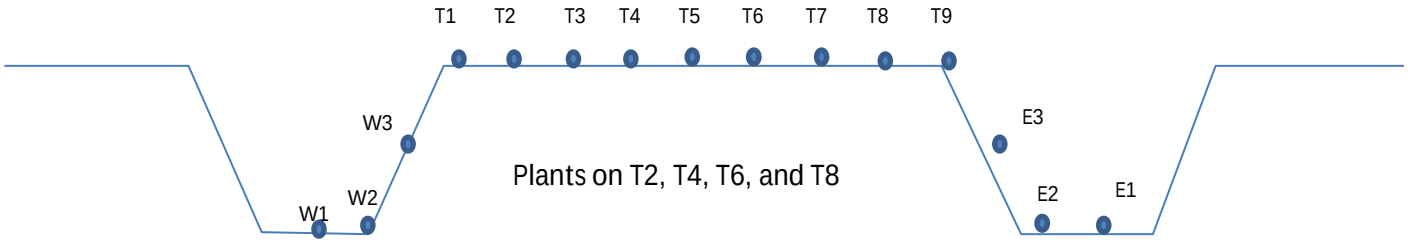
Salinity Data - Top 3 inches

Sammis (RAC)

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (4-Feb-12)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	xx	7.6	12.0	2.4	9.9	7.8	7.7	12.3	5.5	10.0	7.8	5.2	14.3	13.3	xx
Temp(F)	xx	71.4	56.7	63.7	65.1	64.4	63.5	63.0	62.6	61.7	60.6	65.0	66.2	67.0	xx
% Moisture	xx	22.8	26.4	21.7	24.9	25.9	24.8	25.7	24.5	28.7	28.7	23.5	39.5	29.0	xx

Block B - Drip Only (4-Feb-12)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	xx	11.6	11.9	13.7	9.8	4.1	3.2	14.0	11.0	9.4	9.2	2.4	10.5	9.8	10.2
Temp(F)	xx	67.5	65.3	61.2	60.0	60.6	60.6	60.3	60.1	59.4	59.7	50.2	62.6	67.6	x
% Moisture	xx	25.1	23.9	24.0	27.0	21.6	21.6	24.7	27.5	24.8	25.4	25.1	32.0	33.0	x

Block A - Drip Only (03-12-12)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	3.08	5.40	8.88	8.91	5.61	8.46	7.15	8.12	3.99	5.22	4.78	4.40	5.10	1.78
Temp(F)	68.4	69.6	71.2	73.0	73.6	73.4	72.0	72.3	72.9	72.7	71.4	71.6	72.0	72.0	71.6
% Moisture	18.1	32.7	31.2	28.9	26.5	32.5	26.2	27.3	30.5	31.9	35.7	38.8	41.9	41.6	23.1

Block B - Drip Only (03-12-12) (Drip System Running)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	7.43	4.55	6.16	4.72	8.64	4.40	8.95	10.75	8.24	5.02	4.05	9.43	11.32	9.47	4.80
Temp(F)	74.5	73.8	72.5	73.6	73.4	70.2	67.8	65.8	65.1	65.5	64.9	63.5	62.1	61.0	60.8
% Moisture	24.0	37.7	36.4	33.1	34.3	38.8	36.4	42.8	23.1	36.8	33.1	27.5	23.7	35.6	15.6

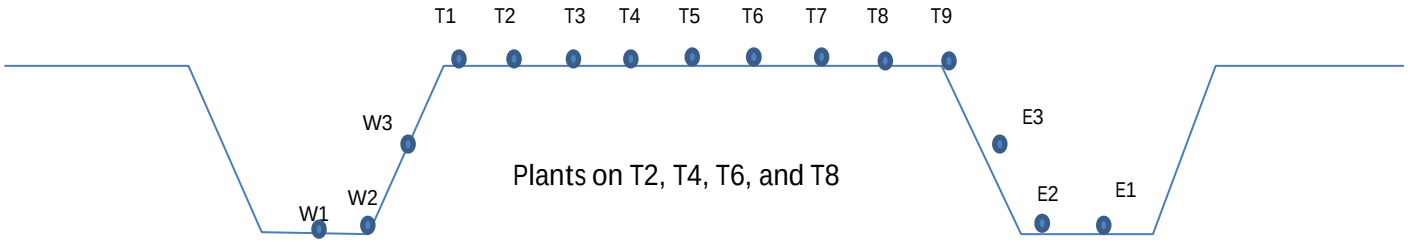
Salinity Data - Top 3 inches

Sammis (RAC)

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (04-10-12)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	3.37	6.73	7.63	5.06	4.27	5.53	4.72	3.92	3.74	3.06	3.03	8.55	5.64	X
Temp(F)	X	78.8	78.1	78.3	78.1	77.2	74.8	74.7	73.6	72.7	70.7	70.0	70.9	72.9	X
% Moisture	X	42.4	39.2	28.5	39.3	41.7	38.6	32.8	38.7	39.4	36.1	33.7	32.5	33.9	X

Block B - Drip Only (04-10-12)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	5.72	5.76	6.36	6.38	4.53	5.93	6.25	8.05	4.19	4.91	3.29	7.69	9.85	X
Temp(F)	X	70.0	69.5	70.3	71.4	71.8	71.1	71.4	70.7	70.2	69.3	68.9	68.5	68.7	X
% Moisture	X	38.5	28.3	33.4	37..3	39.7	35.3	34.7	37.8	39.8	39.2	22.5	36.1	29.9	X

Block A - Drip Only (5-4-12)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.22	7.14	7.25	11.86	11.57	7.62	16.24	15.43	13.2	8.12	9.37	11.78	12.26	8.69	xxx
Temp(F)	73.2	74.3	75.0	75.9	76.5	78.1	75.9	76.3	76.0	75.6	75.4	75.2	75.7	76.8	77.2
% Moisture	22.3	34.7	34.0	25.5	24.5	24.6	26.5	29.4	29.1	34.0	31.2	31.2	29.1	33.0	13.3

Block B - Drip Only (5-4-12)

Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	xxx	6.94	4.32	7.87	6.11	6.36	7.89	8.31	11.06	5.64	12.11	8.86	10.48	5.57	xxx
Temp(F)	xxx	77.2	77.2	77.4	76.5	75.4	74.5	74.3	75.0	75.4	75.0	75.7	75.9	75.7	75.9
% Moisture	xxx	33	27.4	28.7	34.5	31.9	24.3	24.9	26.1	40.2	24.5	34.1	31.9	40.3	23.6

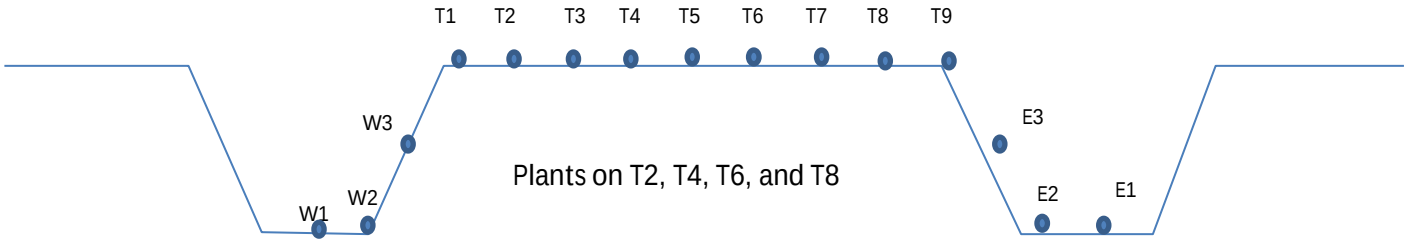
Salinity Data - Top 3 inches

Sammis (RAC)

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (6-20-12)

Sammis	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.4	8.86	10.44	11.68	12	4.5	2.09	11.15	2.97	5.5	2.41	9.87	12.4	7.7	X
Temp(F)	75.2	75.4	75.2	75.2	75.4	76.1	76.5	76.6	77.0	78.3	79.3	80.6	81.7	83.3	X
% Moisture	20.4	30.7	24.4	26.8	22.7	25.8	27.3	26.9	27.4	27.9	21.1	30.0	26.2	29.1	X

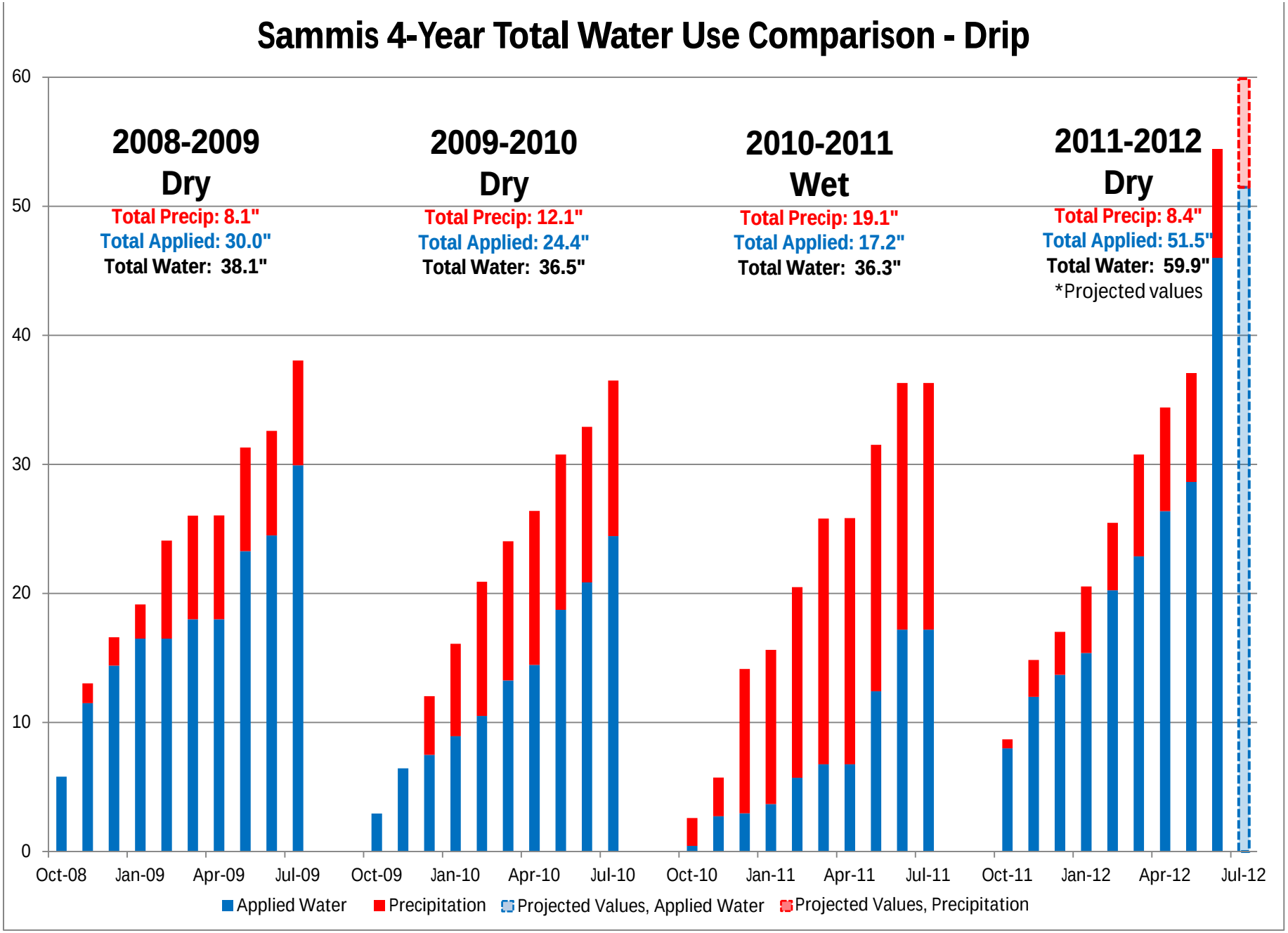
Block B - Drip Only (6-20-12)

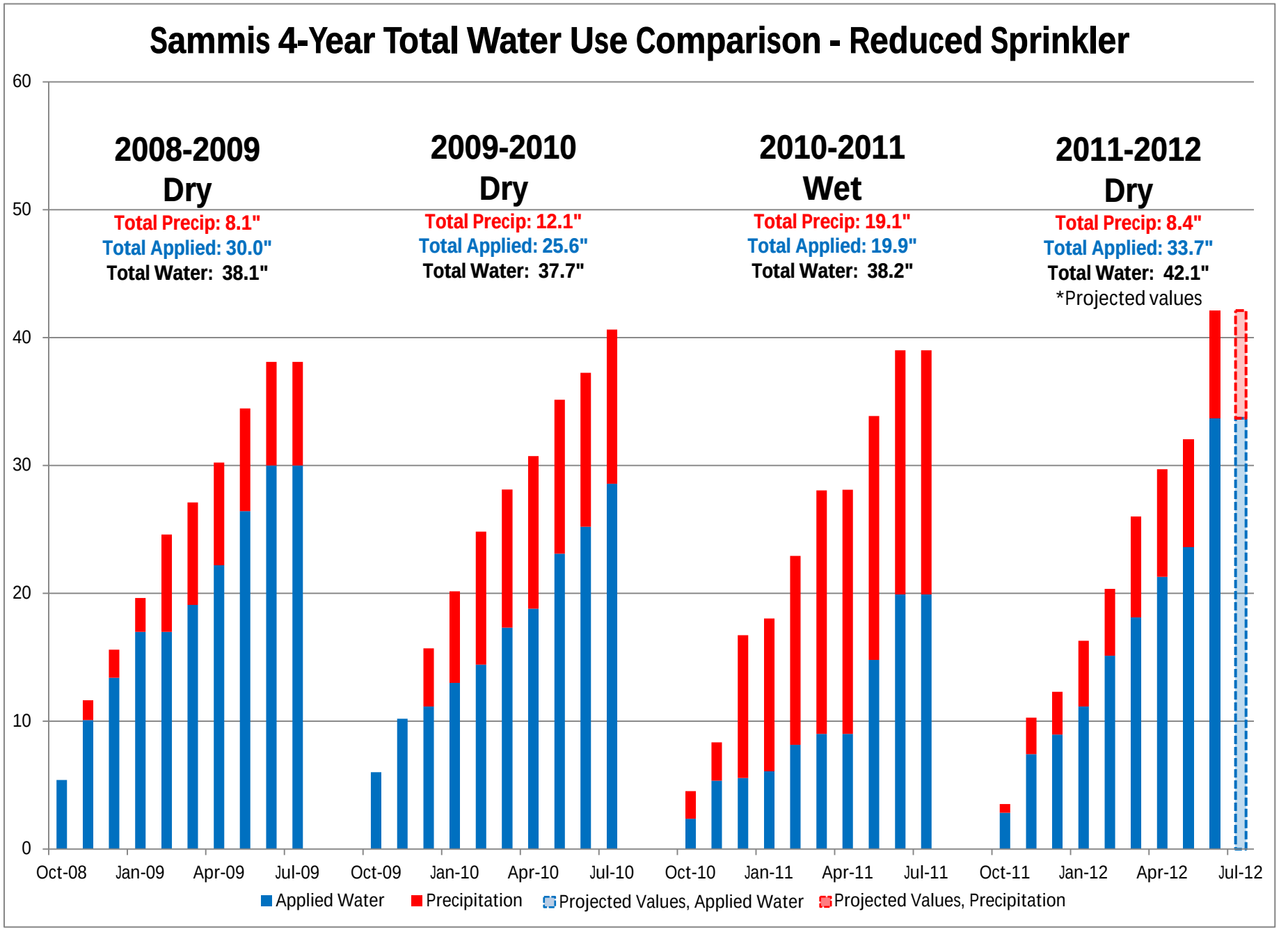
Sammis	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	6.30	7.42	6.98	7.27	7.12	4.73	8.79	4.49	3.64	8.28	7.54	10.63	7.39	X
Temp(F)	X	68.2	70.5	70.9	71.1	71.1	71.6	72.1	72.1	72.0	71.8	71.6	71.4	71.2	X
% Moisture	X	26.3	31.1	22.5	22	26.2	25.2	27.5	25.2	27.4	24.2	22.7	30.8	38.5	X

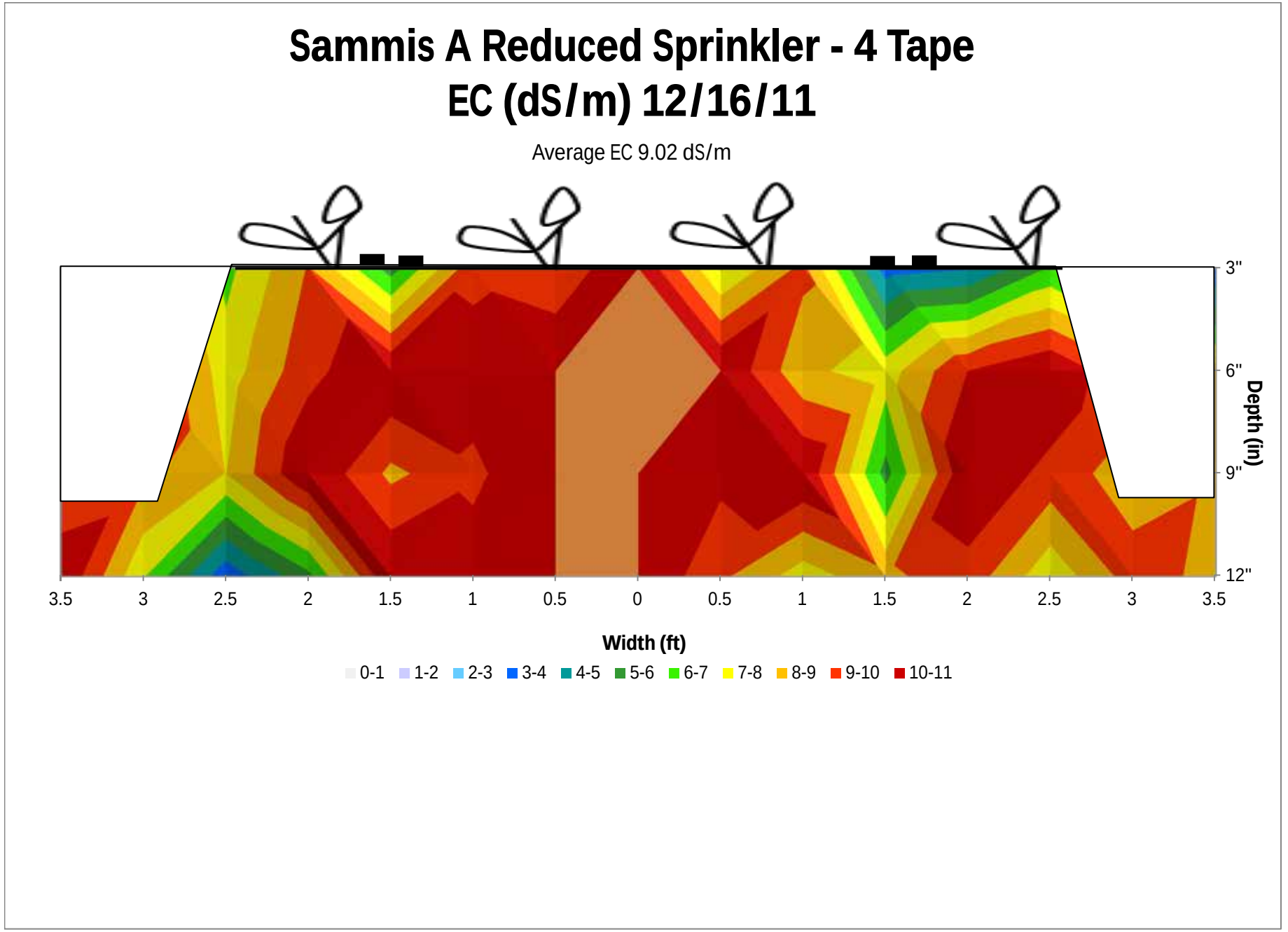
Volumetric Data
Oxnard Area
Sammis

Plant Date: 10/5/11

		4 Tape	
	Date	A -Reduced Sprinkler	B - Conventional
Starting Meter Reading:	10/1/2011	10.94	11.75
Drip Meter Readings	10/7/2011	11.50	11.81
(Volume in AF)	10/11/2011	11.79	12.10
	11/5/2011	12.00	12.34
	11/27/2011	12.23	12.54
	12/16/2011	12.43	12.73
	1/8/2012	12.63	13.00
	2/3/2012	12.98	13.29
	2/22/2012	13.2	13.49
	3/12/2012	13.51	13.86
	4/11/2012	13.92	14.25
	5/4/2012	14.19	14.54
	6/20/2012	16.23	15.78
Volume (AF)	10/7/2011	0.56	0.06
(for the time period)	10/11/2011	0.29	0.29
*Reading - Previous Reading	11/5/2011	0.21	0.24
	11/27/2011	0.23	0.20
	12/16/2011	0.20	0.19
	1/8/2012	0.20	0.27
	2/3/2012	0.35	0.29
	2/22/2012	0.22	0.20
	3/12/2012	0.31	0.37
	4/11/2012	0.41	0.39
	5/4/2012	0.27	0.29
	6/20/2012	2.04	1.24
Area (AC)		1.41	1.48
Total Inches applied from drip (IN)	10/7/2011	4.77	0.49
Equation Used:	10/11/2011	7.23	2.84
=[Volume Used (AF) /	11/5/2011	9.02	4.78
Area(AC)]*(12 IN/FT))+Previous Inches	11/27/2011	10.98	6.41
	12/16/2011	12.68	7.95
	1/8/2012	14.38	10.14
	2/3/2012	17.36	12.49
	2/22/2012	19.23	14.11
	3/12/2012	21.87	17.11
	4/11/2012	25.36	20.27
	5/4/2012	27.66	22.62
	6/20/2012	45.02	32.68
Sprinkler Estimates	10/7/2011	n/a	n/a
Minutes Operated (MIN)	10/11/2011	n/a	n/a
	11/5/2011	301	305
	11/27/2011	0	0
	12/16/2011	0	0
	1/8/2012	0	0
	2/3/2012	0	0
	2/22/2012	0	0
	3/12/2012	0	0
	4/11/2012	0	0
	5/4/2012	0	0
	6/20/2012	0	0
Total Sprinkler Inches (IN)	10/7/2011	n/a	n/a
	10/11/2011	n/a	n/a
	11/5/2011	1.01	1.02
	11/27/2011	1.01	1.02
	12/16/2011	1.01	1.02
	1/8/2012	1.01	1.02
	2/3/2012	1.01	1.02
	2/22/2012	1.01	1.02
	3/12/2012	1.01	1.02
	4/11/2012	1.01	1.02
	5/4/2012	1.01	1.02
	6/20/2012	1.01	1.02
Total Inches (IN)	10/7/2011	4.77	0.49
	10/11/2011	7.23	2.84
	11/5/2011	10.03	5.80
	11/27/2011	11.99	7.43
	12/16/2011	13.69	8.97
	1/8/2012	15.39	11.15
	2/3/2012	18.37	13.51
	2/22/2012	20.24	15.13
	3/12/2012	22.88	18.13
	4/11/2012	26.37	21.29
	5/4/2012	28.67	23.64
	6/20/2012	46.03	33.70

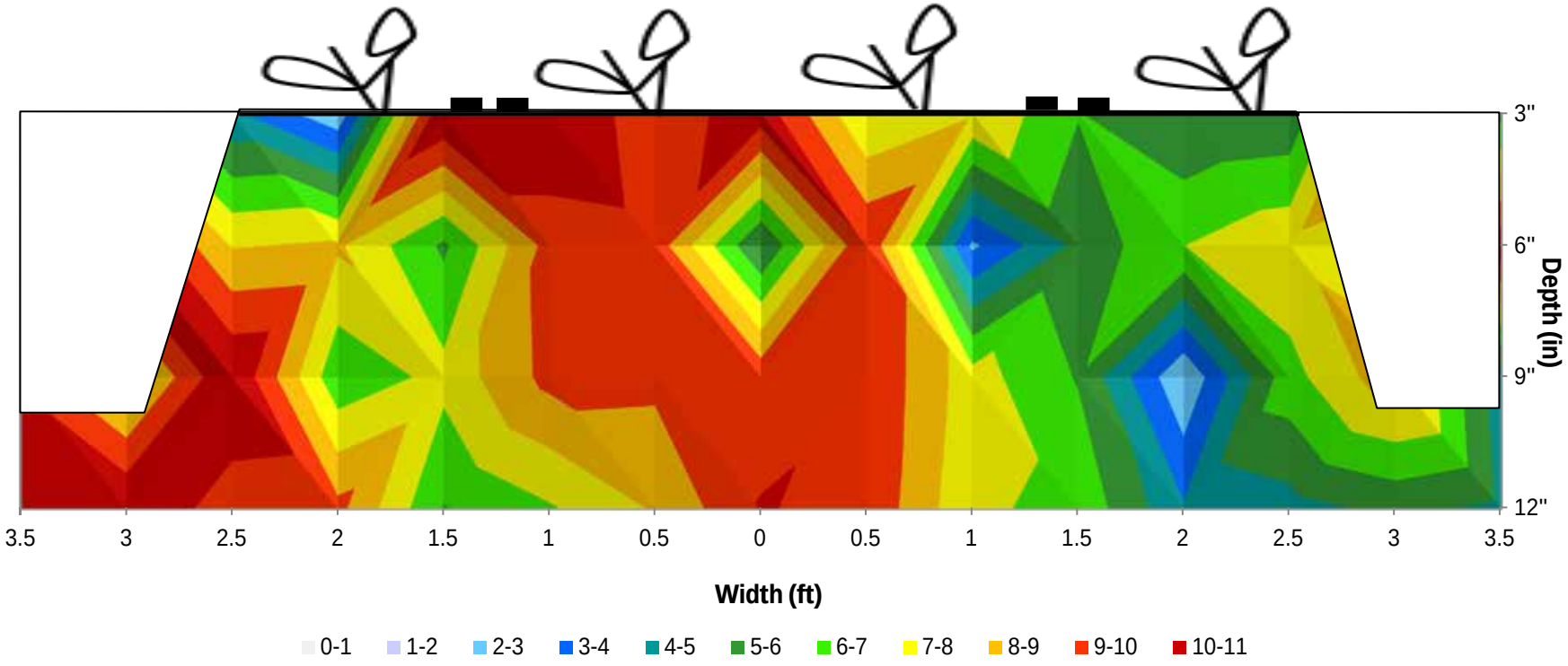

Sammis 4-Year Total Water Use Comparison - Drip
2008-2009
Dry
Total Precip: 8.1"
Total Applied: 30.0"
Total Water: 38.1"
2009-2010
Dry
Total Precip: 12.1"
Total Applied: 24.4"
Total Water: 36.5"
2010-2011
Wet
Total Precip: 19.1"
Total Applied: 17.2"
Total Water: 36.3"
2011-2012
Dry
Total Precip: 8.4"
Total Applied: 51.5"
Total Water: 59.9"
*Projected values
60
50
40
30
20
10
0
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Applied Water
Precipitation
Projected Values, Applied Water
Projected Values, Precipitation


Sammis 4-Year Total Water Use Comparison - Reduced Sprinkler
2008-2009
Dry
Total Precip: 8.1"
Total Applied: 30.0"
Total Water: 38.1"
2009-2010
Dry
Total Precip: 12.1"
Total Applied: 25.6"
Total Water: 37.7"
2010-2011
Wet
Total Precip: 19.1"
Total Applied: 19.9"
Total Water: 38.2"
2011-2012
Dry
Total Precip: 8.4"
Total Applied: 33.7"
Total Water: 42.1"
*Projected values
60
50
40
30
20
10
0
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Applied Water
Precipitation
Projected Values, Applied Water
Projected Values, Precipitation


Sammis A Reduced Sprinkler - 4 Tape
EC (dS/m) 12/16/11
Average EC 9.02 dS/m
3"
6"
9"
12"
Depth (in)
3.5 3 2.5 2 1.5 1 0.5 0 0.5 1 1.5 2 2.5 3 3.5
Width (ft)
0-1 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8-9 9-10 10-11

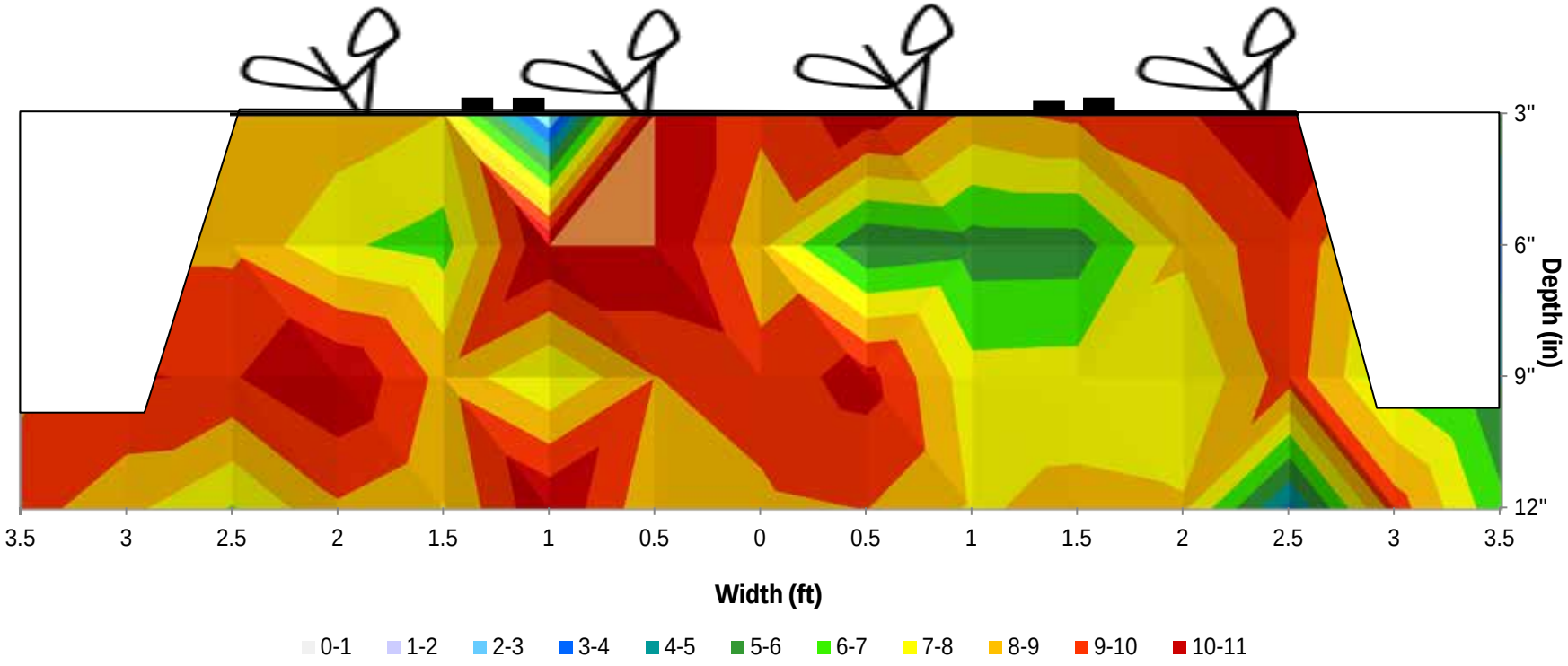
Sammis A Reduced Sprinkler - 4 Tape
EC (dS/m) 3/12/12

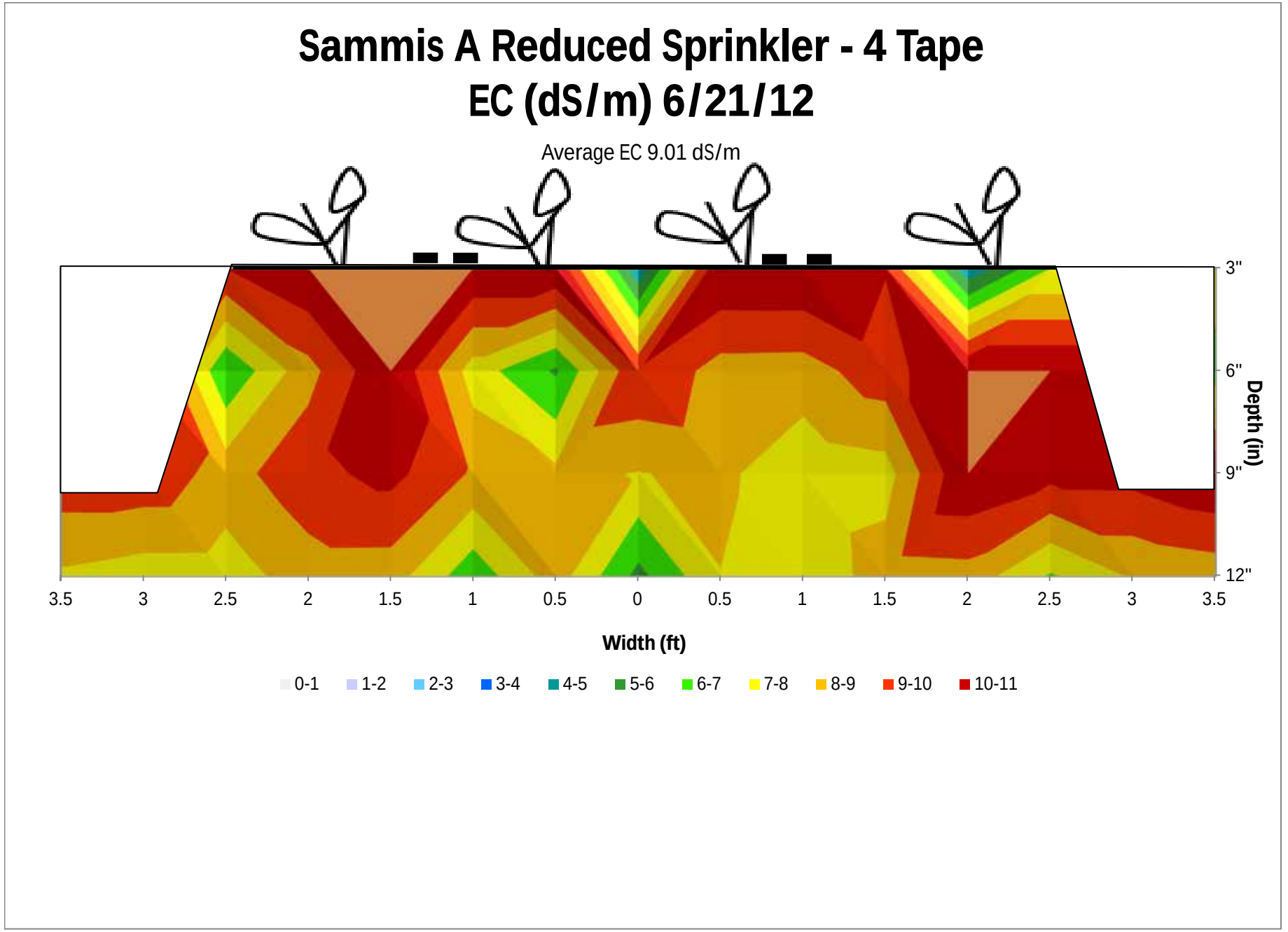
Average EC 7.59 dS/m



Sammis A Reduced Sprinkler - 4 Tape
EC (dS/m) 5/4/12

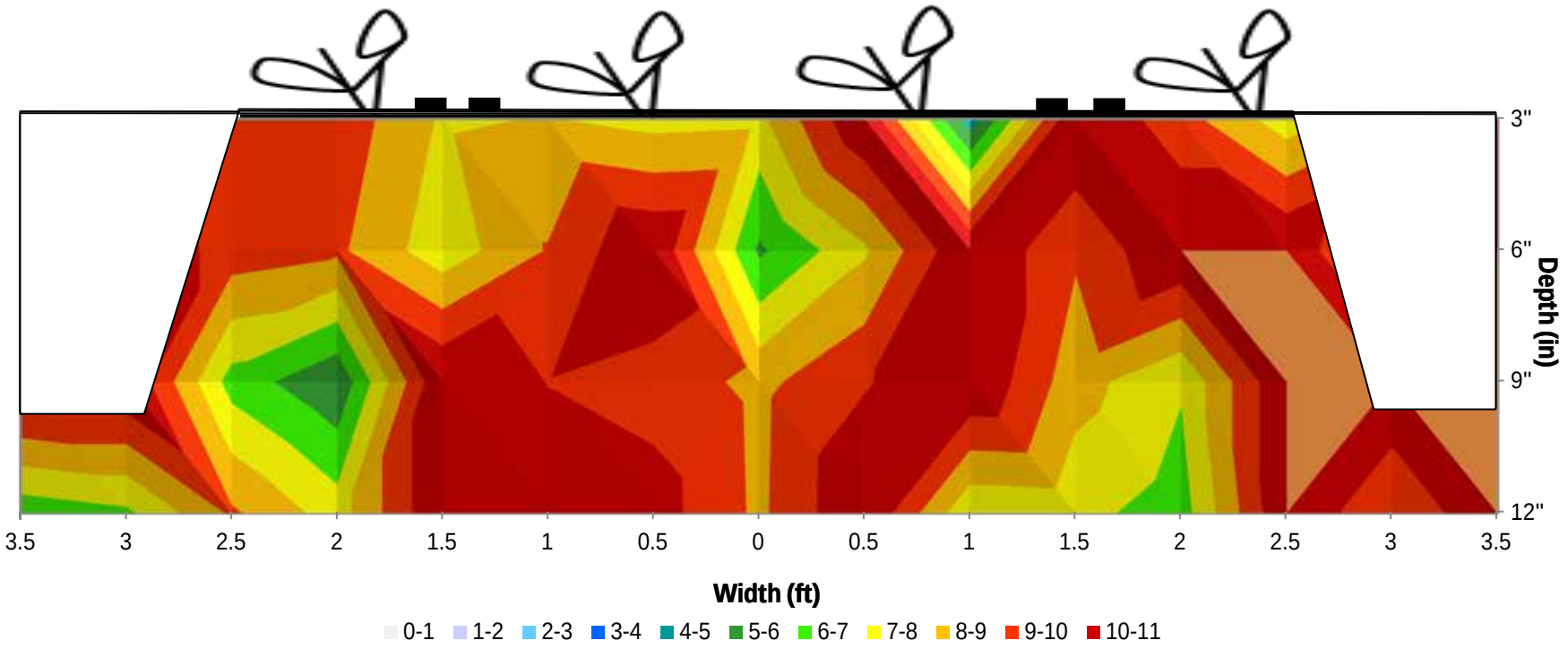
Average EC 8.25 dS/m




Sammis A Reduced Sprinkler - 4 Tape
EC (dS/m) 6/21/12
Average EC 9.01 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
3.5
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11

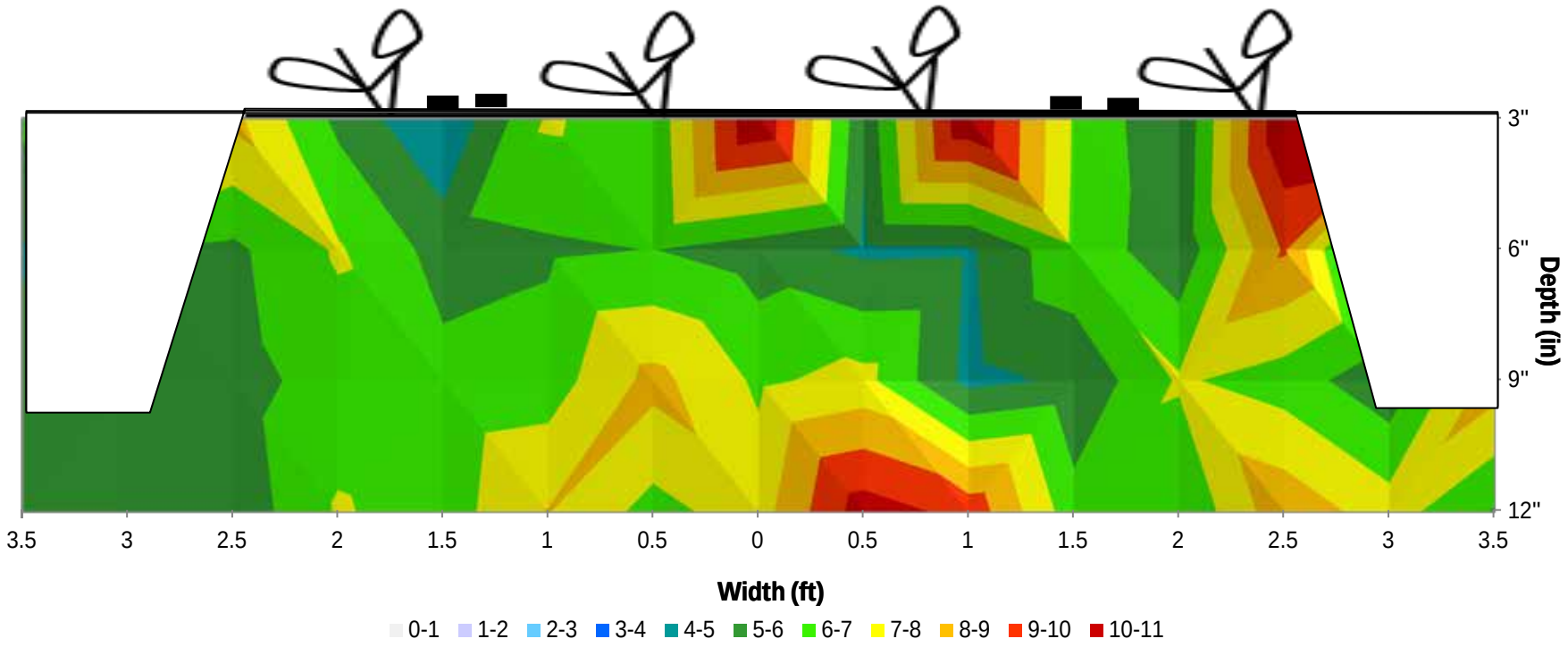
Sammis B Conventional - 4 Tape
EC (dS/m) 12/16/11

Average EC 9.5 dS/m



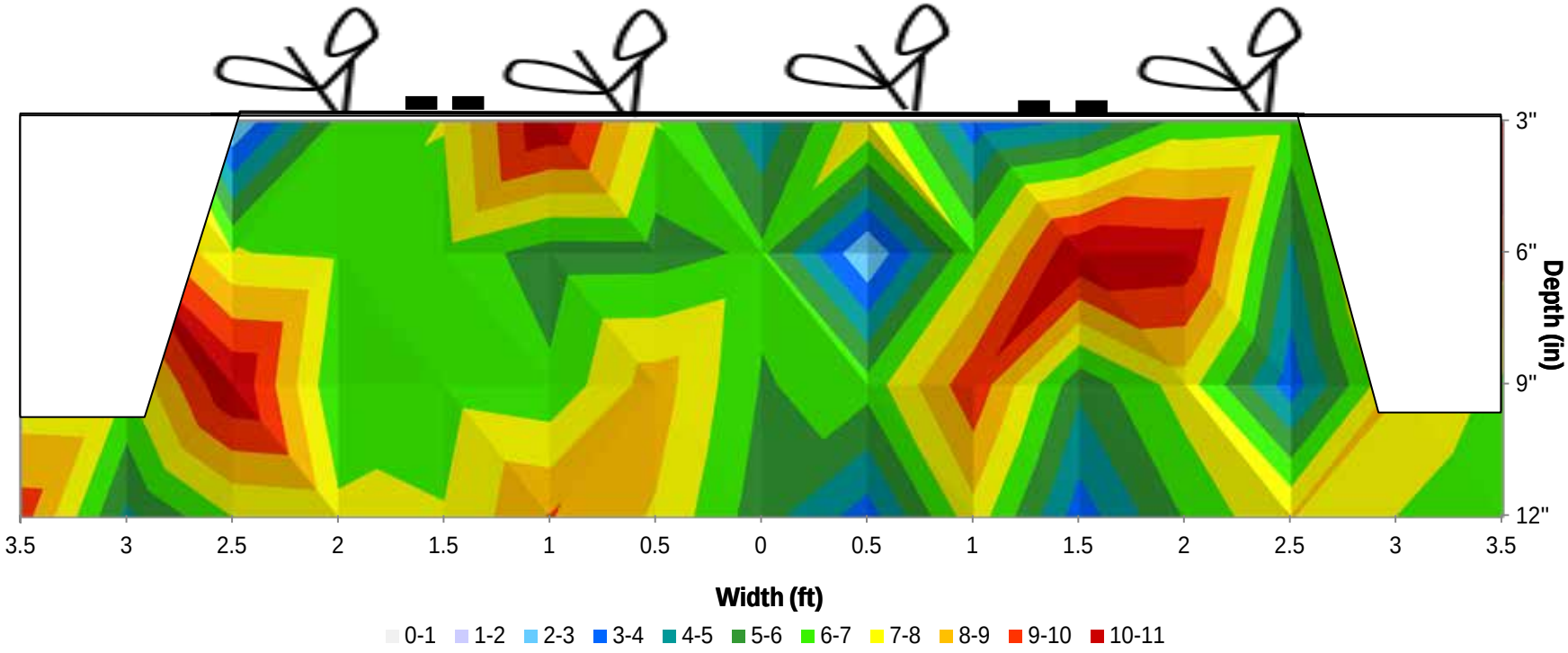
Sammis B Conventional - 4 Tape
EC (dS/m) 3/12/12

Average EC 7.01 dS/m



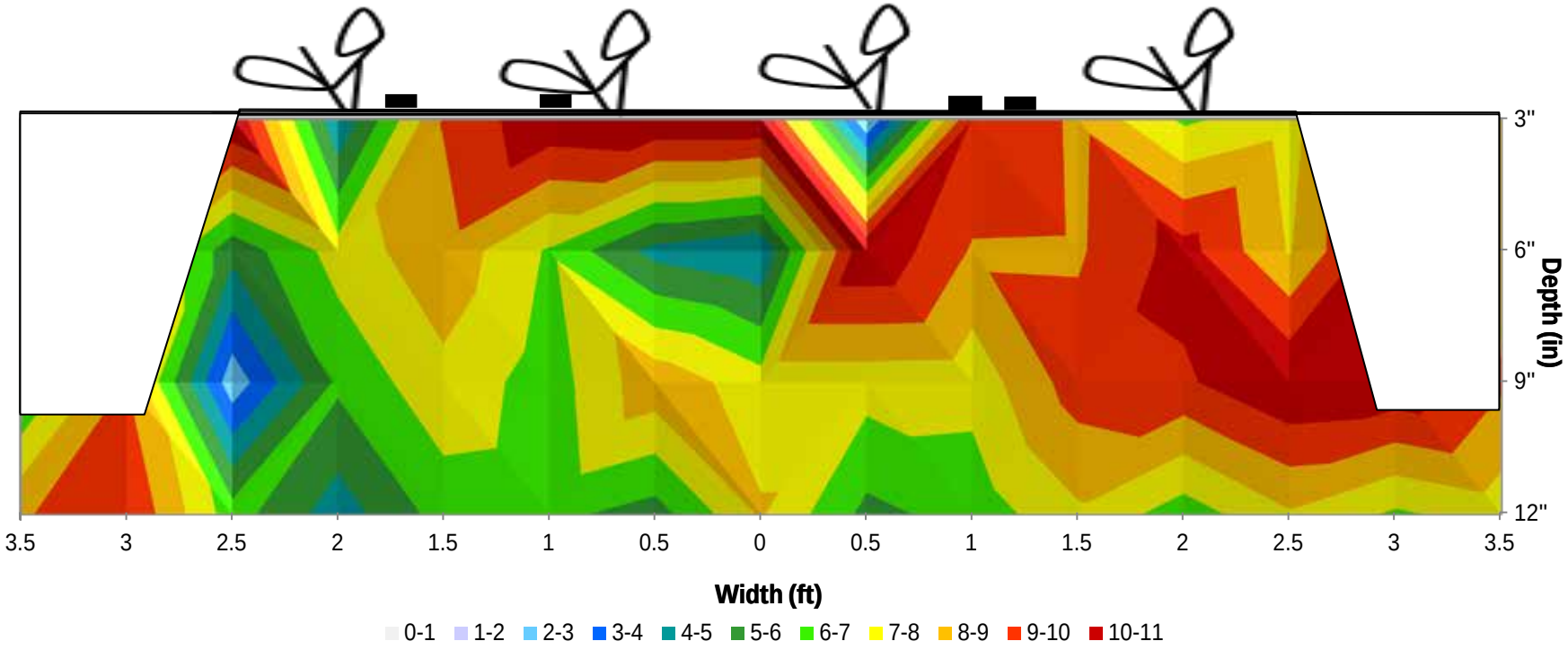
Sammis B Conventional - 4 Tape
EC (dS/m) 5/4/12

Average EC 7.32 dS/m



Sammis B Conventional - 4 Tape
EC (dS/m) 6/21/12

Average EC 8.23 dS/m



Eclipse

Eclipse – Block I

Conventional

10/7/2011 – 6 DAP

10/22/2011 – 21 DAP

11/5/2011 – 35 DAP

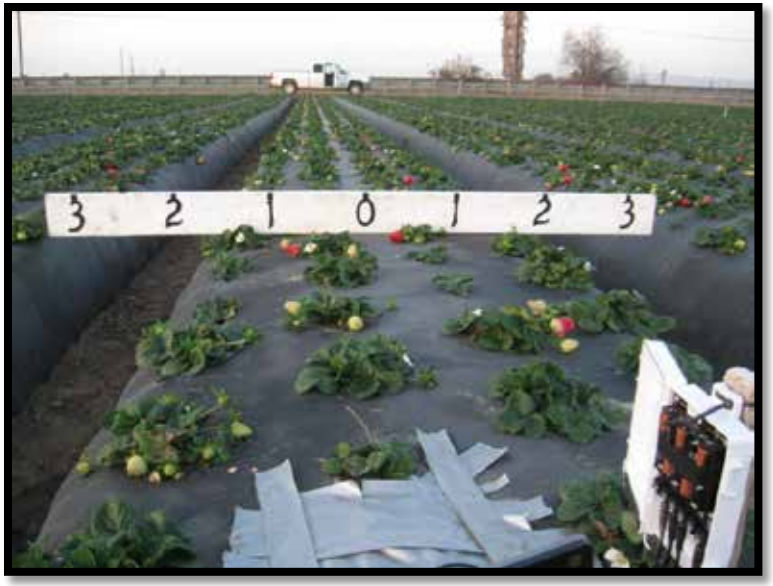
11/27/2011 – 57 DAP

Eclipse – Block I

Conventional

12/16/2011 – 76 DAP

1/12/2012 – 103 DAP



2/3/2012 – 125 DAP

2/21/2012 – 143 DAP

Eclipse – Block I

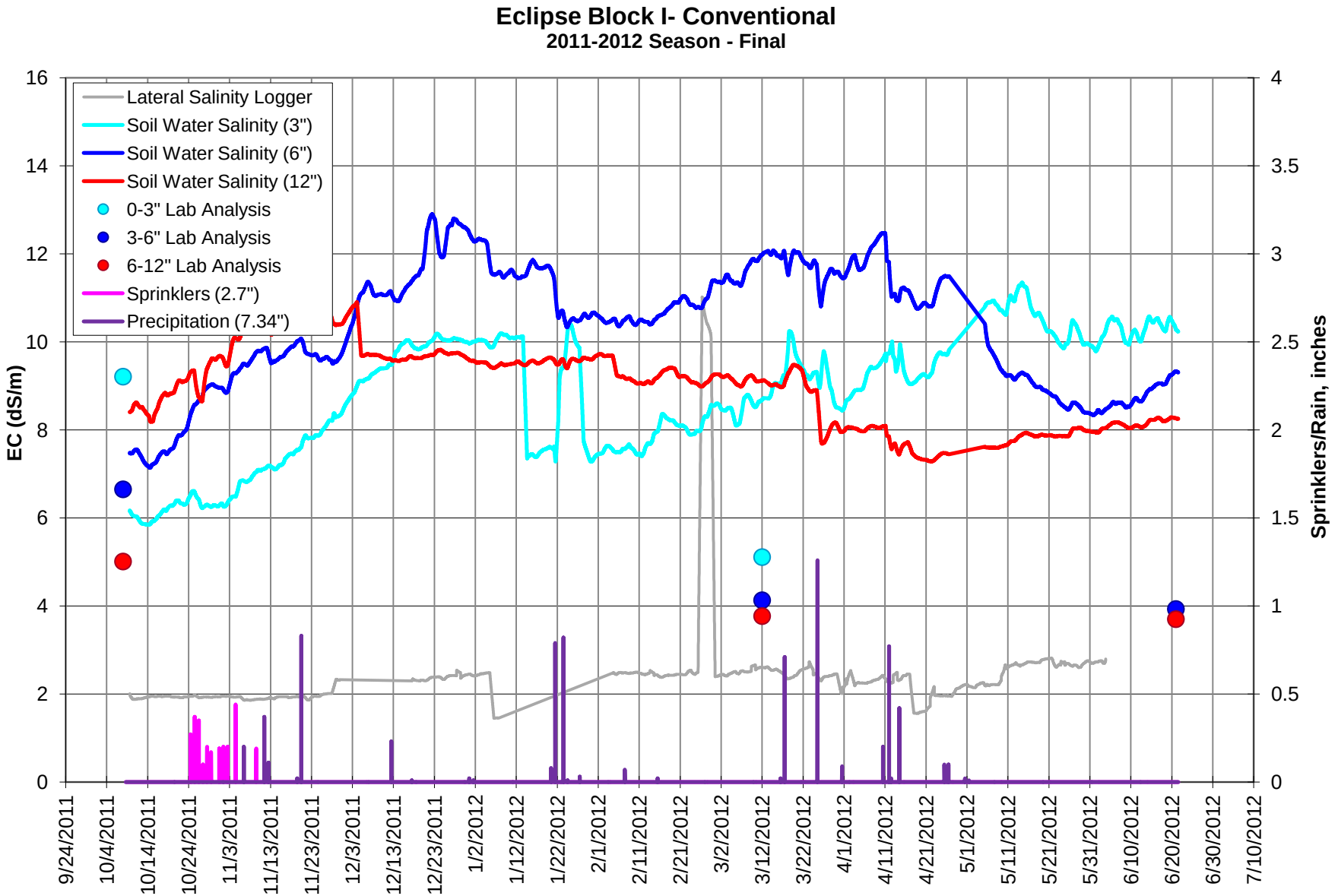
Conventional

3/12/2012 – 163 DAP

4/11/2012 – 163 DAP

5/4/2012 – 186 DAP

6/21/2012 – 234 DAP


Eclipse Block I- Conventional
2011-2012 Season - Final
Lateral Salinity Logger
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (2.7")
Precipitation (7.34")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
9/24/2011
10/4/2011
10/14/2011
10/24/2011
11/3/2011
11/13/2011
11/23/2011
12/3/2011
12/13/2011
12/23/2011
1/2/2012
1/12/2012
1/22/2012
2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012

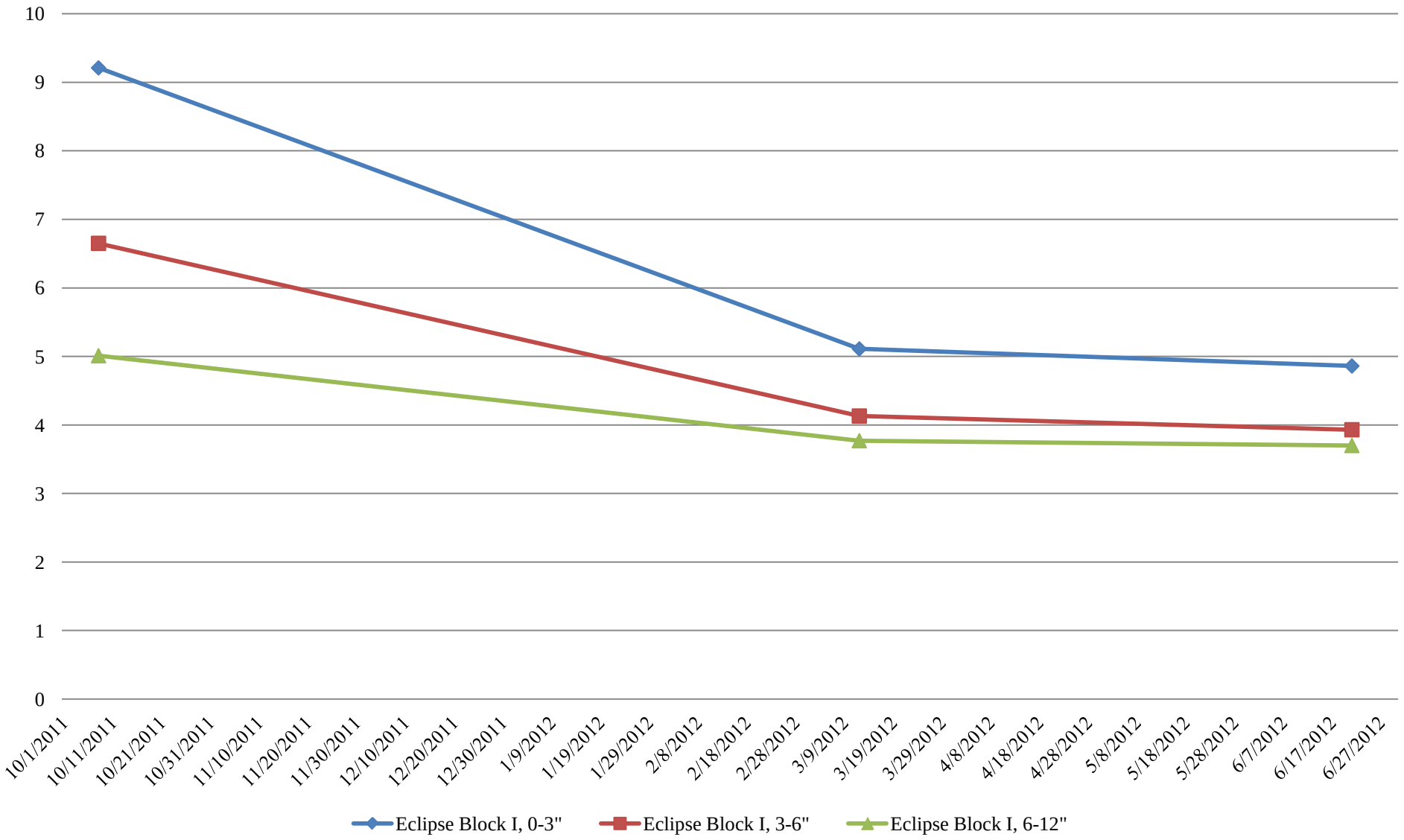
Evaluation of Modified Drip Irrigation Strategies on Strawberries - Eclipse Blocks

Date:		10/8/2011			3/12/2012			6/21/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block I	0-3"	SSS	9.21	728.00	SSS	5.11	112.35	SSS	4.86	299.60
	3-6"	SSS	6.65	193.20	SSS	4.13	107.10	SSS	3.93	137.20
	6-12"	SSS	5.01	181.65	SSS	3.77	55.30	SSS	3.70	68.25

Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

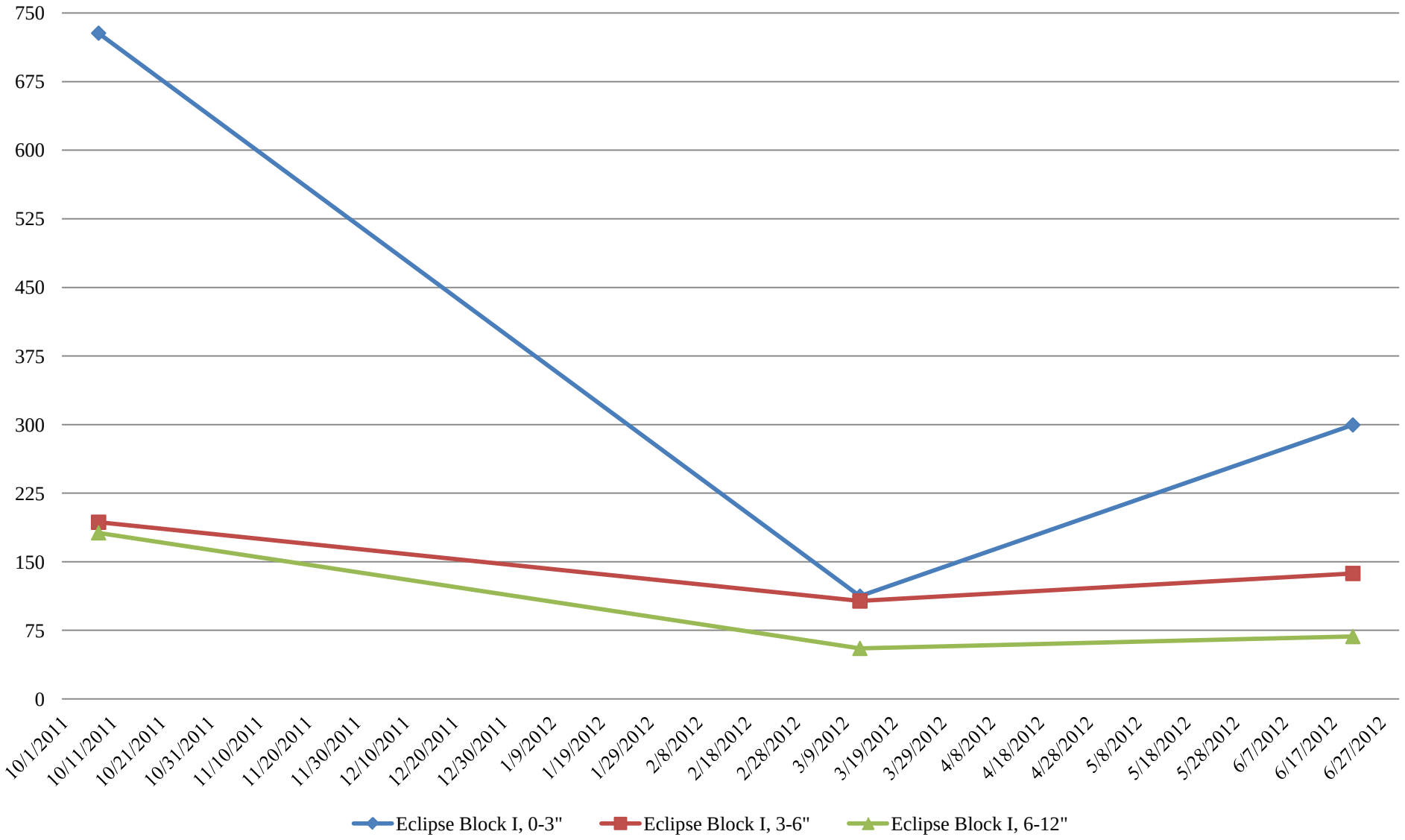
Eclipse Block I

Salinity



Eclipse Block I

Chloride



Salinity Data - Top 3 inches

Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants

www.itrc.org/report/pdf/jdwtAug2012.pdf

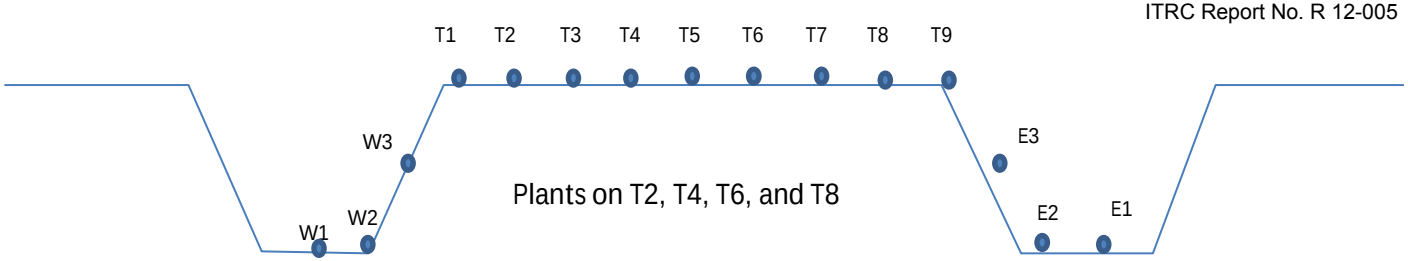
ITRC Report No. R 12-005

Eclipse

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block I - Drip Only (07-Oct-11)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	3.2	6.1	5.5	5.4	14.2	8.9	10.3	12.2	5.1	4.5	6.9	9.0	14.7	5.4	4.5
% Moisture	27	28	24	20	26	26	26	24	24	25	25	19	22	29	26

Block I - Drip Only (22-Oct-11)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	6.2	5.8	10.1	12.5	7.7	10.2	11.3	7.7	10.1	8.8	7.8	6.3	13.5	7.5	4.6
Temp(F)	64	64	64	64	64	64	64	64	65	65	65	61	65	65	65
% Moisture	28	29	26	27	30	25	17	17	23	19	21	27	18	26	23

Block I - Drip Only (05-Nov-11)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	4.1	6.3	6.6	10.2	7.3	9.9	6.4	8.2	5.8	5.6	7.5	8.7	9.3	6.0	7.8
Temp(F)	58	57	96	55	54	54	54	55	55	56	57	59	62	63	63
% Moisture	27	28	29	28	30	24	25	27	25	26	27	24	28	29	23

Block I - Drip Only (27-Nov-11)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	2.6	6.3	5.3	7.7	5.2	7.9	8.2	8.1	7.0	4.1	10.7	9.5	6.1	2.9	2.8
Temp(F)	62	60	60	59	58	57	57	58	58	58	58	59	61	61	61
% Moisture	30	29	21	28	33	28	26	26	26	26	27	26	28	29	21

Salinity Data - Top 3 inches

www.itrc.org/report/pdf/jdwtAug2012.pdf

Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants

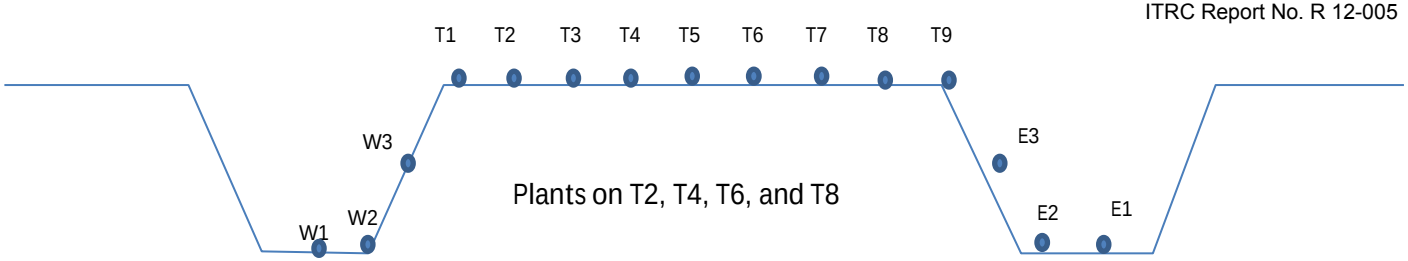
ITRC Report No. R 12-005

Eclipse

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block I - Drip Only (16-Dec-11)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	5.1	0.6	14.0	14.4	8.0	6.4	9.9	12.6	9.1	12.6	12.0	12.0	9.6	8.4	12.7
Temp(F)	66	66	66	66	66	67	67	67	67	66	66	66	66	67	67
% Moisture	14	19	18	18	16	16	19	20	20	22	22	22	21	21	16

Block I - Drip Only (08-Jan-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.5	13.6	11.1	14.3	2.2	5.7	5.7	12.2	12.2	12.0	11.5	12.1	2.4	9.1	12.3
Temp(F)	59	59	59	59	59	59	59	59	59	60	60	60	60	60	60
% Moisture	16	25	189	20	22	20	20	22	18	18	20	18	12	22	19

Block I - Drip Only (4-Feb-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	xx	1.4	5.0	8.3	5.8	13.3	10.8	10.1	12.8	9.2	9.1	9.4	12.9	11.9	xx
Temp(F)	xx	73	73	75	76	46	76	75	74	74	73	72	72	71	xx
% Moisture	xx	20	17	23	22	20	24	28	22	18	18	18	18	18	xx

Block I - Drip Only (03-12-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	1.70	6.43	7.59	8.09	8.56	9.40	7.45	9.91	9.75	5.05	9.12	7.26	9.91	X
Temp(F)	65.5	65.8	65.3	64.6	64.2	64.8	65.7	66.2	68.2	69.2	70.2	70.5	73.0	73.9	72.1
% Moisture	13.8	25.4	23.6	23.6	25.2	21.3	19.4	20.1	22.7	20.4	21.1	22.2	22.7	27.9	10.7

Salinity Data - Top 3 inches

www.itrc.org/report/pdf/jdwtAug2012.pdf

Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants

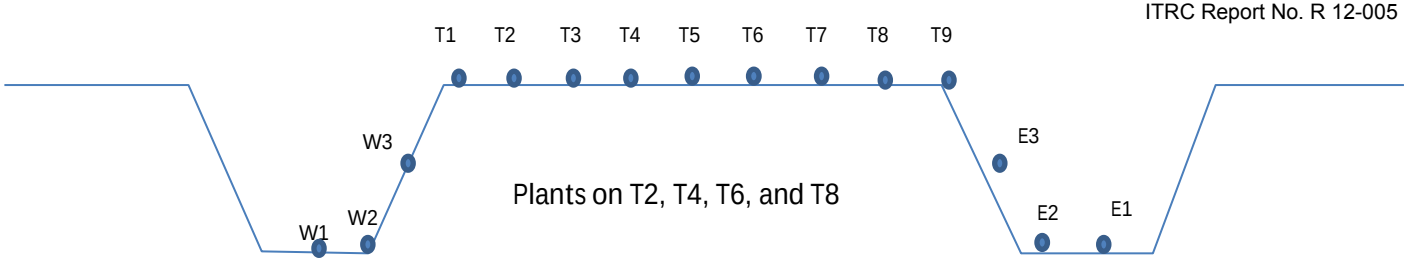
ITRC Report No. R 12-005

Eclipse

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block I - Drip Only (04-11-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	9.16	9.03	6.69	14.03	8.86	9.53	12.52	13.74	10.28	7.09	6.20	5.74	7.25	5.95	4.09
Temp(F)	63.9	64.2	64.4	64.6	64.9	65.1	66.0	67.1	67.8	67.6	67.5	67.8	68.4	68.4	67.5
% Moisture	24.0	31.2	29.1	21.1	26.1	24.8	24.6	24.1	25.2	27.3	24.4	22.0	26.2	25.3	15.8

Block I - Drip Only (5-4-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	5.23	7.95	7.40	7.97	7.35	6.92	10.54	6.48	8.45	5.61	4.25	8.24	6.80	3.42	0.29
Temp(F)	76.3	76.1	74.1	71.6	70.7	71.2	70.7	69.1	67.6	73.8	73.9	74.8	77.0	79.0	80.4
% Moisture	11.4	22.1	21.8	22.0	19.4	20.6	25.3	22.3	22.6	21.9	19.4	22.1	20.4	24.0	16.1

Block I - Drip Only (6-21-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	5.65	5.42	4.29	9.26	7.84	1.31	7.91	9.00	7.31	1.07	7.45	4.68	1.66	X
Temp(F)	X	83.1	83.3	83.1	83.3	83.5	83.8	83.7	84.2	84.9	86.4	86.7	86.9	87.1	X
% Moisture	X	20.6	16.0	13.3	11.4	13.4	14.2	15.3	13.6	12.7	15.1	11.5	12.4	16.3	X

Volumetric Data
Oxnard Area
Eclipse

Plant Date:

	4 Tape
Date	I-Conventional
10/7/2011	19.10
10/11/2011	19.10
11/5/2011	19.10
11/27/2011	19.15
12/16/2011	19.25
1/8/2012	19.52
2/3/2012	19.91
2/22/2012	19.91
3/12/2012	20.51
4/11/2012	21
5/4/2012	21.35
6/21/2012	22.49

Starting Meter Reading:
Drip Meter Readings
(Volume in AF)

10/7/2011	0.00
10/11/2011	0.00
11/5/2011	0.00
11/27/2011	0.05
12/16/2011	0.10
1/8/2012	0.27
2/3/2012	0.39
2/22/2012	0.00
3/12/2012	0.60
4/11/2012	0.49
5/4/2012	0.35
6/21/2012	1.14

Volume (AF)
(for the time period)
*Reading - Previous Reading

Area (AC)	3.4

10/7/2011	0.00
10/11/2011	0.00
11/5/2011	0.00
11/27/2011	0.18
12/16/2011	0.53
1/8/2012	1.48
2/3/2012	2.86
2/22/2012	2.86
3/12/2012	4.98
4/11/2012	6.71
5/4/2012	7.94
6/21/2012	11.96

Total Inches applied from drip (IN)
Equation Used:
=[Volume Used (AF) / Area(AC)]*(12 IN/FT))+Previous Inches

10/1/2011	na
10/7/2011	na
10/11/2011	na
11/5/2011	749
11/27/2011	57
12/16/2011	0
1/8/2012	0
2/3/2012	0
2/22/2012	0
3/12/2012	0
4/11/2012	0
5/4/2012	0
6/21/2012	0

Sprinkler Estimates
Minutes Operated (MIN)

10/1/2011	na
10/7/2011	na
10/11/2011	na
11/5/2011	2.50
11/27/2011	2.70
12/16/2011	2.70
1/8/2012	2.70
2/3/2012	2.70
2/22/2012	2.70
3/12/2012	2.70
4/11/2012	2.70
5/4/2012	2.70
6/21/2012	2.70

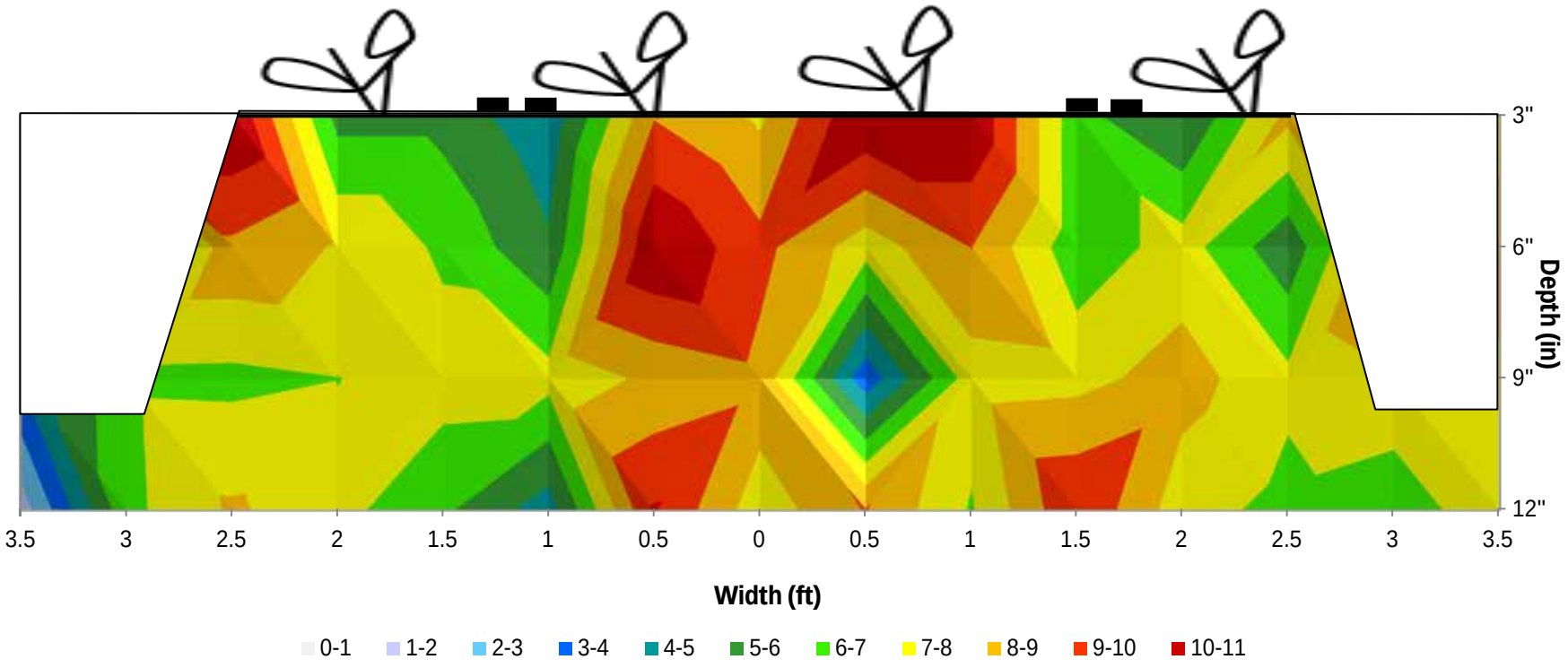
Total Sprinkler Inches (IN)

10/7/2011	0.00
10/11/2011	0.00
11/5/2011	2.50
11/27/2011	2.87
12/16/2011	3.22
1/8/2012	4.18
2/3/2012	5.55
2/22/2012	5.55
3/12/2012	7.67
4/11/2012	9.40
5/4/2012	10.64
6/21/2012	14.66

Total Inches (IN)

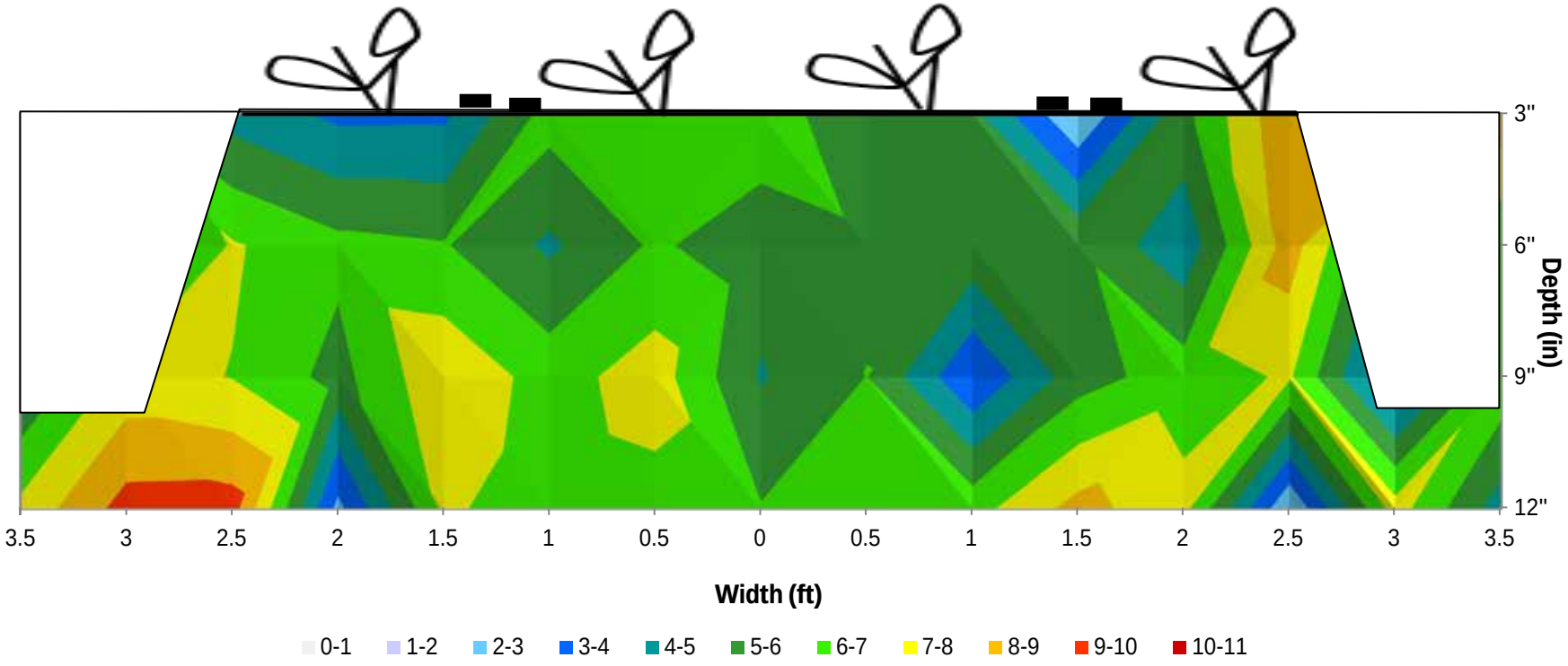
Eclipse I Conventional - 4 Tape
EC (dS/m) 3/12/12

Average EC 7.67 dS/m



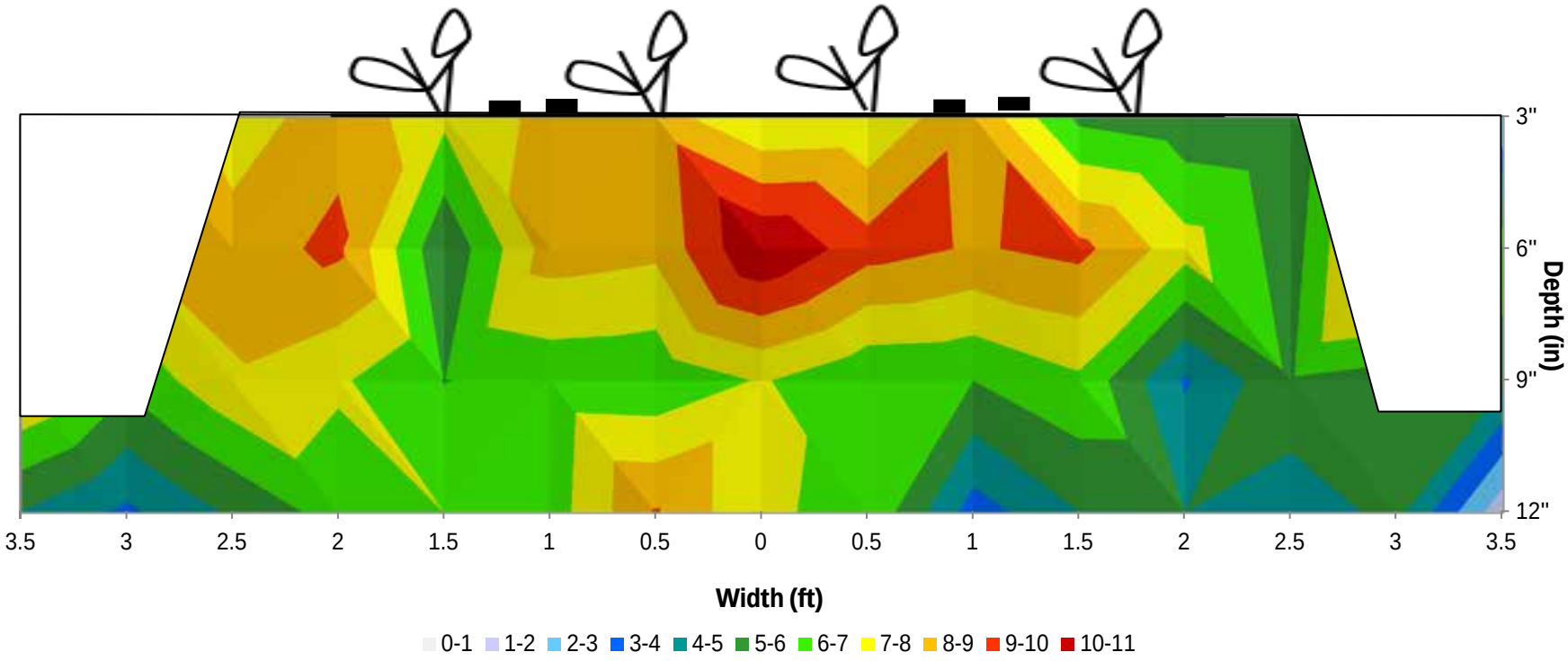
Eclipse I Conventional - 4 Tape
EC (dS/m) 5/4/12

Average EC 6.07 dS/m



Eclipse I Conventional - 4 Tape
EC (dS/m) 6/21/12

Average EC 6.73 dS/m



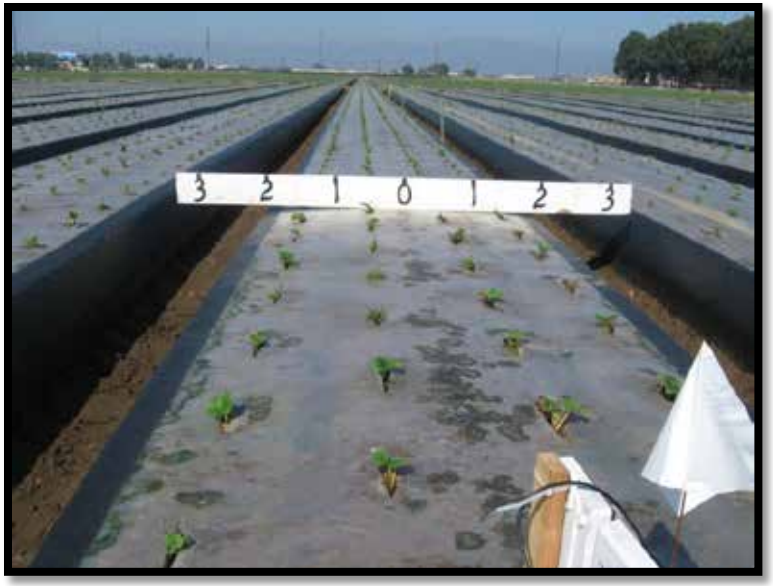
Donlon

Donlon - Block A

Reduced Sprinkler

10/7/2011 – - 6 DAP

10/22/2011 – 9 DAP



11/5/2011 – 23 DAP

11/27/2011 – 45 DAP

Donlon - Block A

Reduced Sprinkler

12/17/2011 – 65 DAP

1/12/2012 – 91 DAP

2/3/2012 – 113 DAP

2/21/2012 – 131 DAP

Donlon - Block A

Reduced Sprinkler

3/12/2012 – 151 DAP

4/12/2012 – 182 DAP

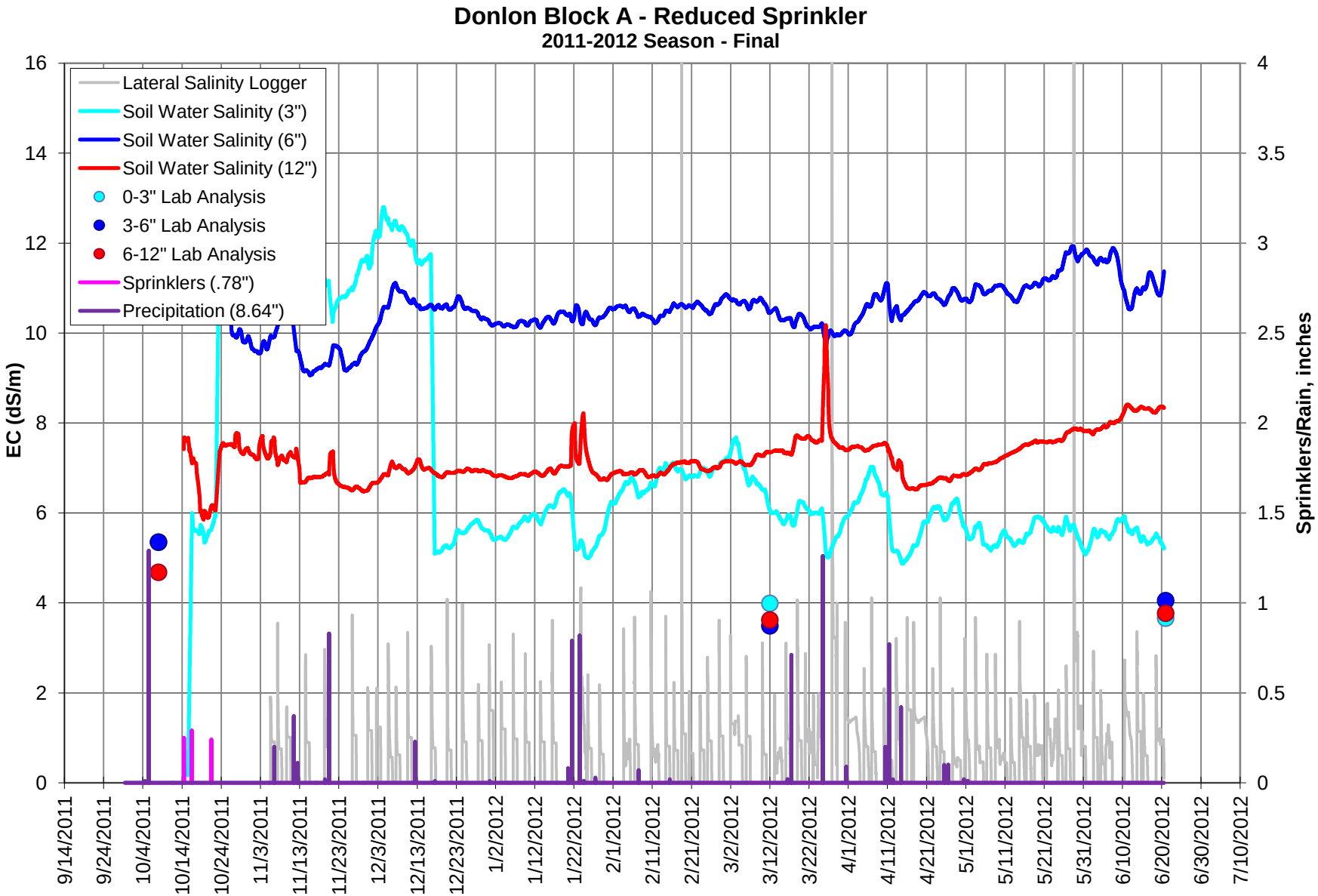
5/3/2012 – 203 DAP

6/7/2012 – 238 DAP

Donlon - Block A

Reduced Sprinkler

6/20/2012 – 251 DAP

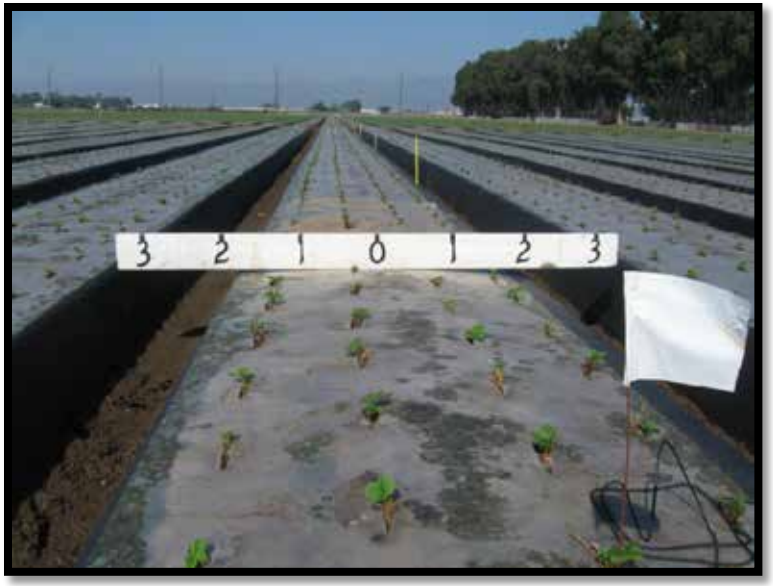

Donlon Block A - Reduced Sprinkler
2011-2012 Season - Final
Lateral Salinity Logger
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (.78")
Precipitation (8.64")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
9/14/2011
9/24/2011
10/4/2011
10/14/2011
10/24/2011
11/3/2011
11/13/2011
11/23/2011
12/3/2011
12/13/2011
12/23/2011
1/2/2012
1/12/2012
1/22/2012
2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012

Donlon - Block B

Conventional

10/7/2011 – - 6 DAP

10/22/2011 – 9 DAP



11/5/2011 – 23 DAP

11/27/2011 – 45 DAP

Donlon - Block B

Conventional

12/16/2011– 65 DAP

1/12/2012– 91 DAP

2/03/2012– 113 DAP

2/21/2012– 131 DAP

Donlon - Block B

Conventional

3/12/2012 – 151 DAP

4/12/2012 – 182 DAP

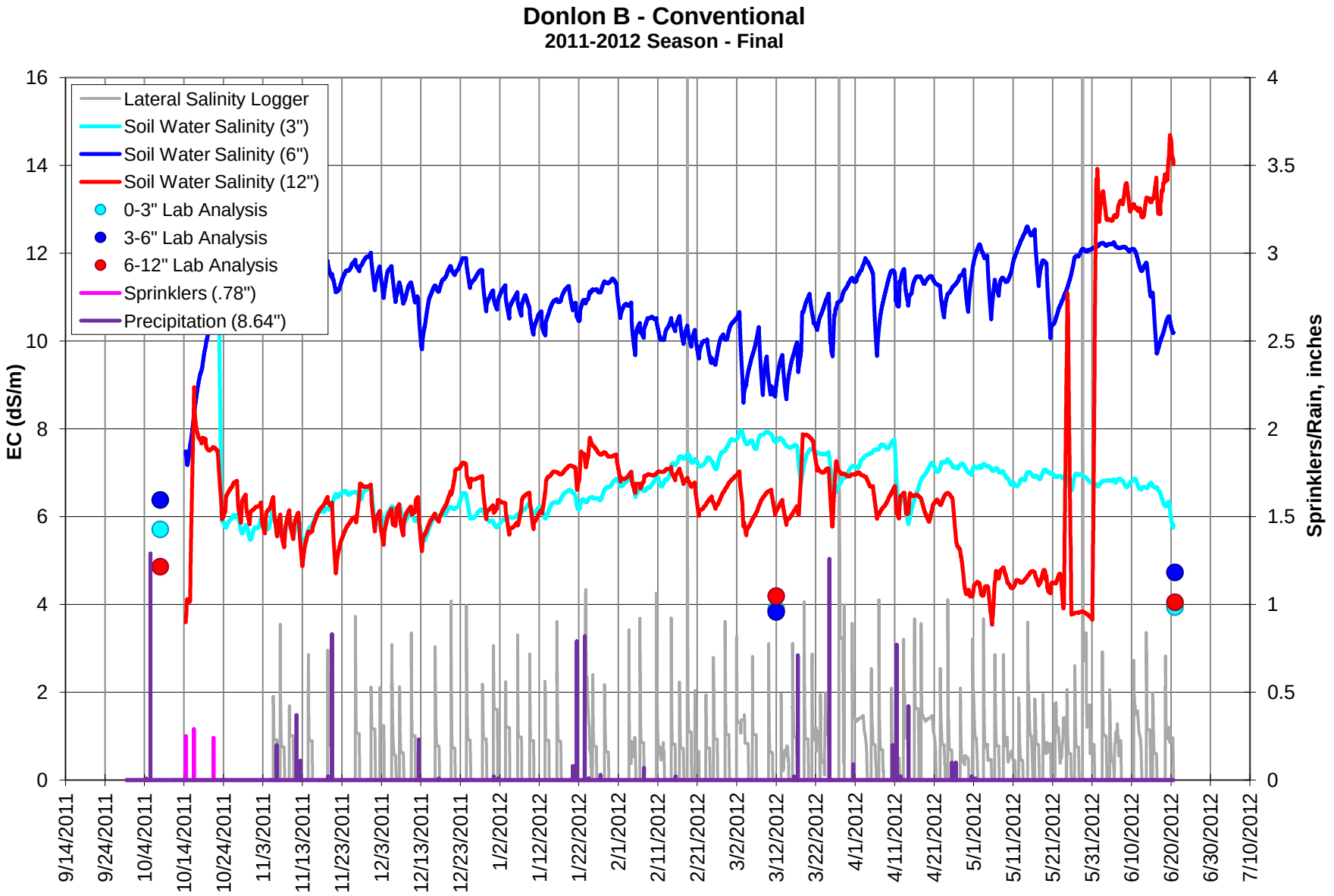
5/3/2012 – 203 DAP

6/7/2012 – 238 DAP

Donlon - Block B

Conventional

6/20/2012 – 251 DAP

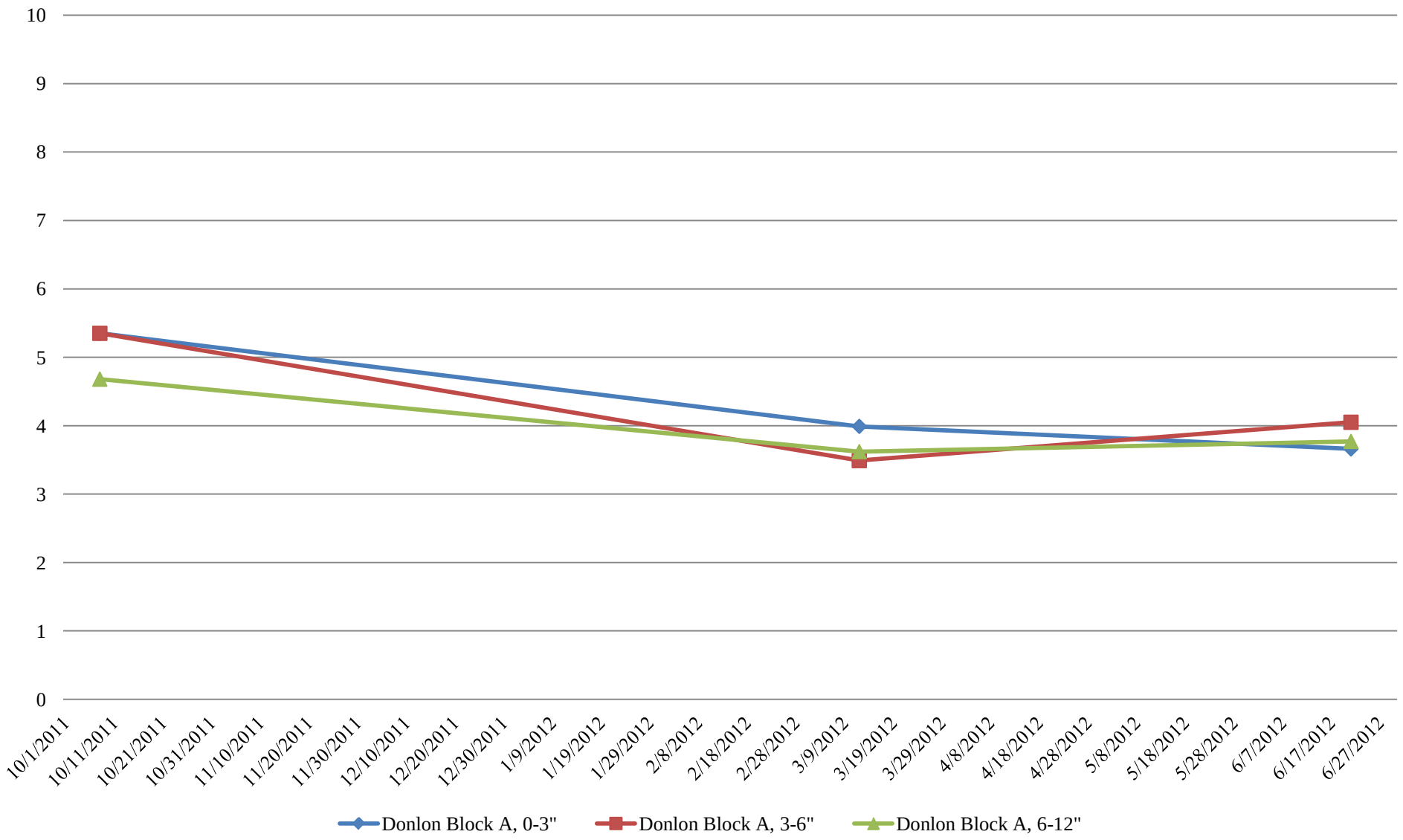

Donlon B - Conventional
2011-2012 Season - Final
Lateral Salinity Logger
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (.78")
Precipitation (8.64")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
9/14/2011
9/24/2011
10/4/2011
10/14/2011
10/24/2011
11/3/2011
11/13/2011
11/23/2011
12/3/2011
12/13/2011
12/23/2011
1/2/2012
1/12/2012
1/22/2012
2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012

Date:		10/8/2012			3/12/2012			6/21/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	5.35	280.50	DLS	3.99	81.20	DLS	3.66	108.50
	3-6"	DLS	5.35	191.80	DLS	3.49	74.20	DLS	4.05	107.80
	6-12"	DLS	4.68	138.25	DLS	3.62	69.30	DLS	3.77	98.35
Block B	0-3"	SSS	5.71	272.30	SSS	3.89	88.90	SSS	3.94	68.60
	3-6"	SSS	6.38	98.00	SSS	3.83	59.50	SSS	4.73	117.95
	6-12"	SSS	4.86	93.45	SSS	4.19	90.30	SSS	4.05	115.50

Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

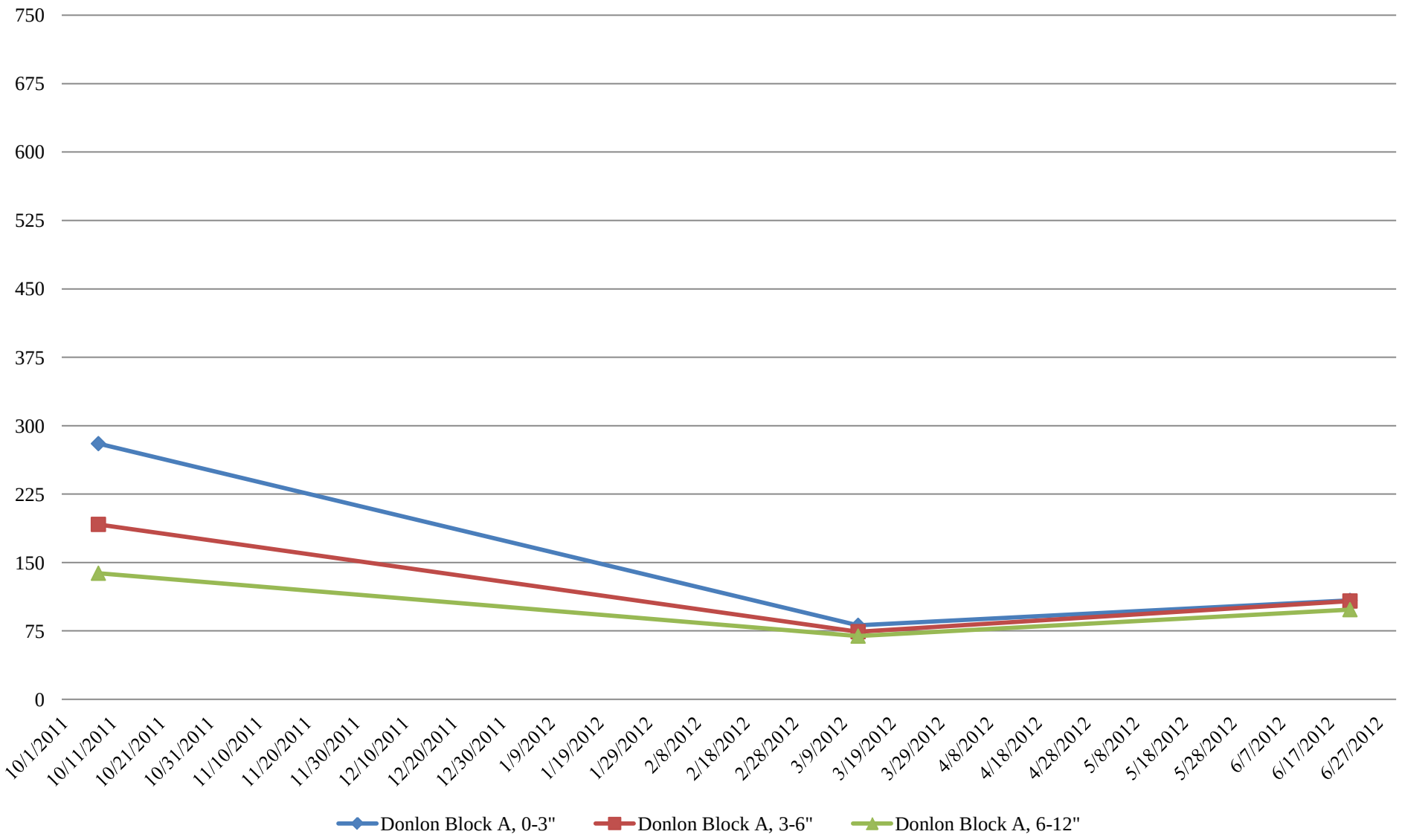
Donlon Block A

Salinity



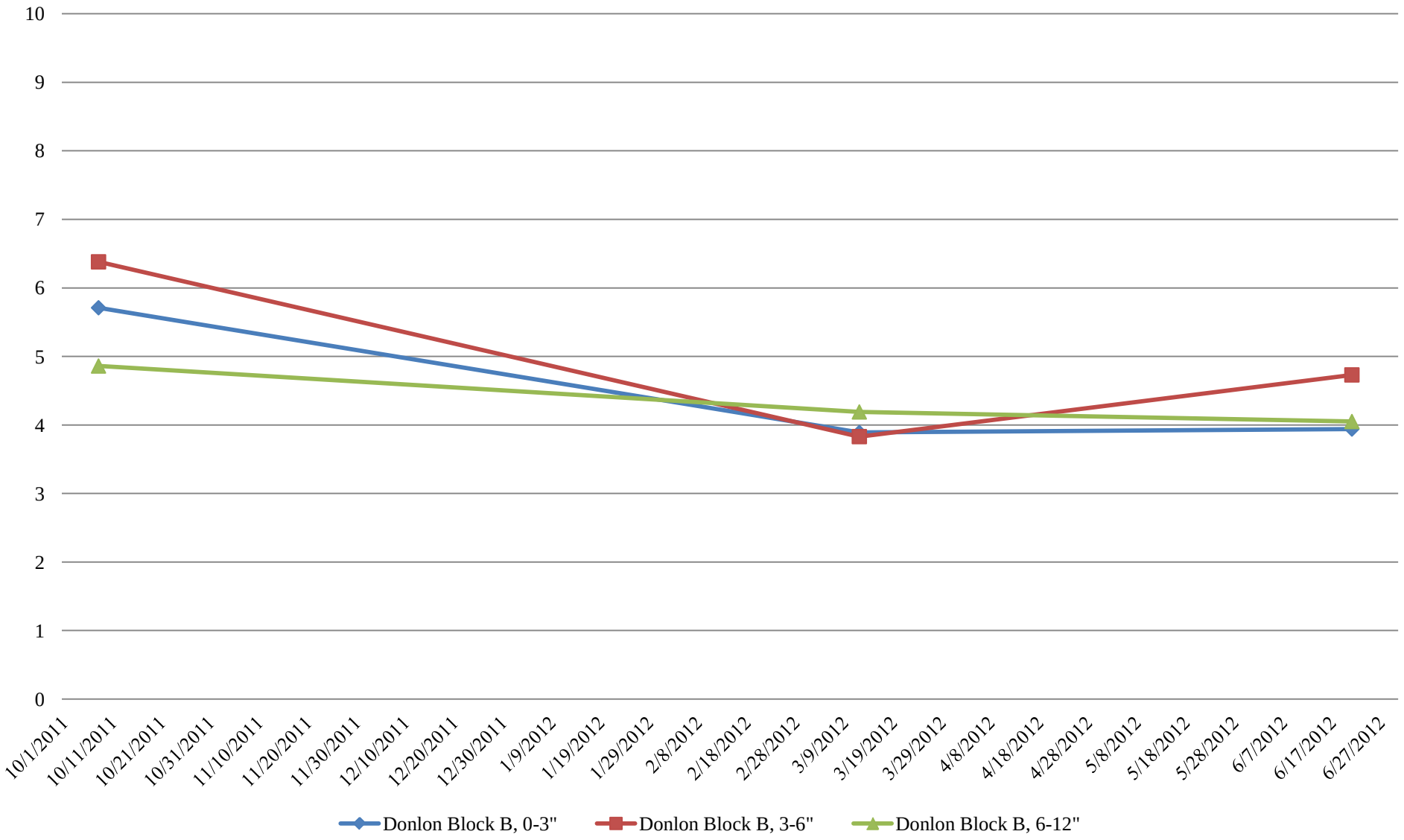
Donlon Block A

Chloride



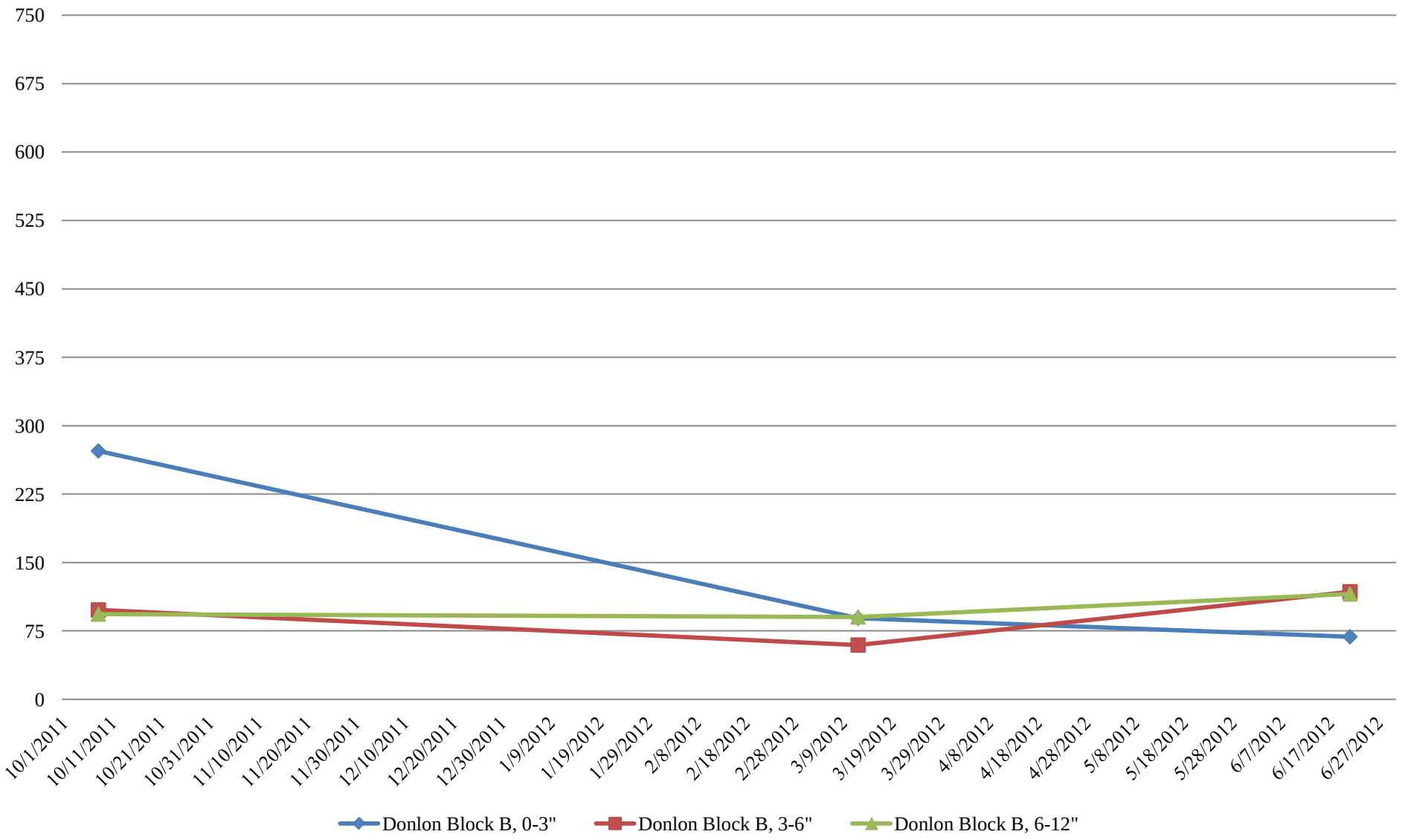
Donlon Block B

Salinity



Donlon Block B

Chloride



Salinity Data - Top 3 inches

www.itrc.org/report/pdf/jdwtAug2012.pdf

Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants

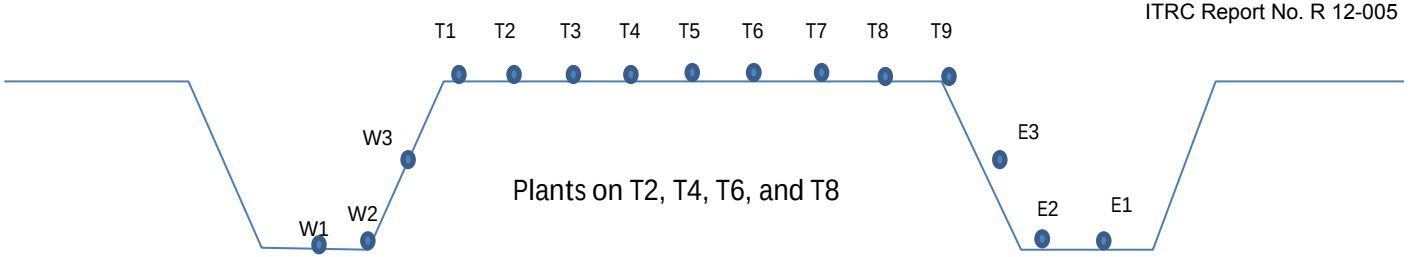
ITRC Report No. R 12-005

Donlon

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (07-Oct-11)

Donlon	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	5.2	6.9	6.4	8.2	5.0	7.9	1.5	9.2	3.7	6.0	6.3	5.4	14.5	6.3	10.0
% Moisture	25	29	20	20	19	18	18	20	17	19	23	13	27	22	23

Block B - Partial Sprinkler (07-Oct-11)

Donlon	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	5.2	6.9	6.4	8.2	5.0	7.9	1.5	9.2	3.7	6.0	6.3	5.4	14.5	6.3	10.0
% Moisture	25	29	20	20	19	18	18	20	17	19	23	13	27	22	23

Block A - Drip Only (22-Oct-11)

Donlan	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	11.4	8.5	14.5	6.2	18.4	4.8	16.9	11.9	11.5	6.2	5.4	8.8	3.9	25.3	6.7
Temp(F)	77	78	77	77	79	81.5	82	83	84	84	85	86	86.7	85.8	84
% Moisture	37	22	23	22	21	20.5	19	21	26	26	23	19	21	6.4	27

Block B - Drip Only (22-Oct-11)

Donlan	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	9.6	8.0	7.3	5.5	7.8	6.2	6.4	6.2	6.8	5.2	5.6	9.4	12.0	6.0	3.9
Temp(F)	79	78	80	80	82	83	83	84	85	85	85	86	836	84	83
% Moisture	29	26	24	24	24	19	19	25	23	22	19	19	22	22	26

Salinity Data - Top 3 inches

www.itrc.org/report/pdf/jdwtAug2012.pdf

Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants

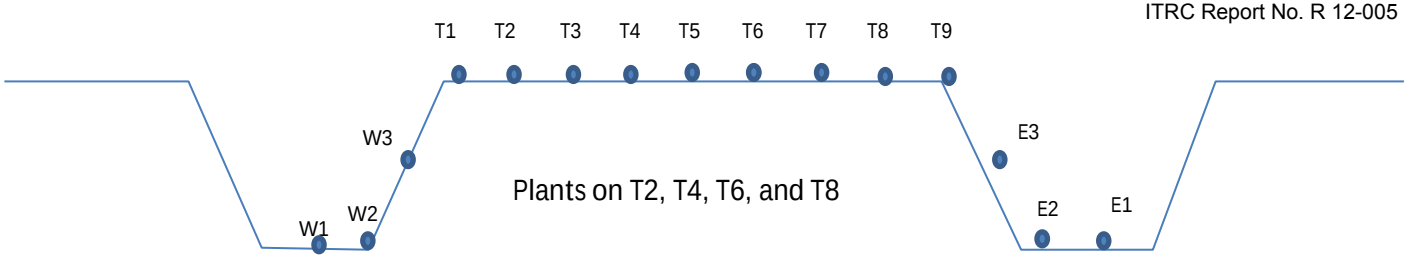
ITRC Report No. R 12-005

Donlon

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (05-Nov-11)

Donlan	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	5.4	4.9	14.2	4.8	4.8	3.9	10.0	10.2	6.4	6.8	5.1	9.0	16.3	8.1	x
Temp(F)	66	65.8	66	67	67.1	62.6	67	66	65	66	65	65	64	63.6	x
% Moisture	12	23.2	24	20	20.8	24.8	18	22	23	27	20	20	24	24.3	x

Block B - Drip Only (05-Nov-11)

Donlan	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	12.1	7.3	10.2	5.7	3.4	3.9	7.0	9.3	10.7	5.3	10.4	7.2	10.2	1.1	1.1
Temp(F)	57	58	60	62	62	63	63	63	62	62	62	62	61	61	61
% Moisture	26	31	27	27	25	25	25	27	24	26	28	22	25	23	17

Block A - Drip Only (27-Nov-11)

Donlan	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	2.4	4.4	9.5	4.8	7.5	7.7	8.0	15.7	8.7	7.1	5.4	7.1	11.9	8.2	0.7
Temp(F)	75	74.7	74	74	13.9	14.1	74	74	75	75	76	65	78	78.1	78.1
% Moisture	16	22.6	24	21	12.4	14.1	21	21	23	19	22	20	22	23	15.1

Block B - Drip Only (27-Nov-11)

Donlan	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	4.2	9.6	9.8	5.0	4.8	4.0	7.9	6.7	8.7	10.8	5.6	7.7	14.2	9.1	1.1
Temp(F)	77	77	76	76	76	77	77	77	77	77	77	78	78	29	28
% Moisture	20	24	23	23	23	22	25	24	25	22	23	23	23	23	23

Salinity Data - Top 3 inches

www.itrc.org/report/pdf/jdwtAug2012.pdf

Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants

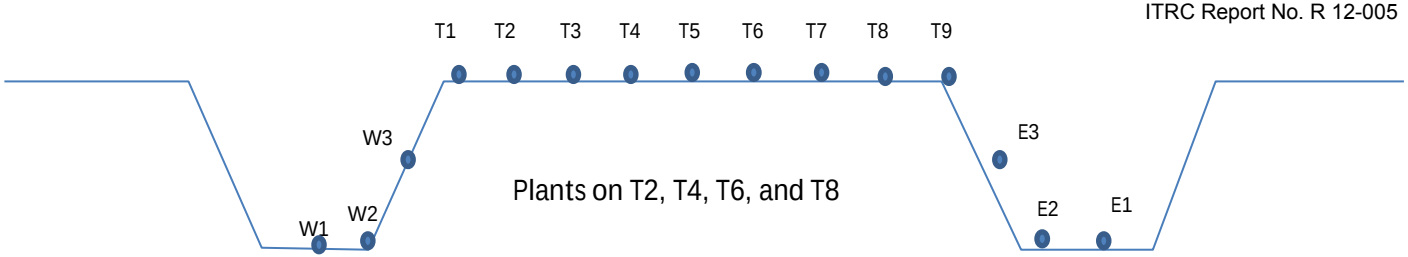
ITRC Report No. R 12-005

Donlon

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (16-Dec-11)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	10.0	5.7	19.1	7.0	7.2	10.3	10.5	11.2	9.6	8.0	8.1	10.9	13.5	11.8	15.6
Temp(F)	65	66	57	66	66	66	67	67	68	68	68	68	69	69	69
% Moisture	20	23	21	20	21	27	24	21	22	22	21	19	23	21	22

Block B - Drip Only (16-Dec-11)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	10.0	5.7	6.8	3.6	4.9	8.6	5.7	4.4	1.8	5.9	6.5	5.4	13.0	11.3	8.2
Temp(F)	67	66	66	66	66	66	66	66	66	66	66	67	67	68	63
% Moisture	20	27	22	24	23	16	20	22	22	57	22	23	21	21	22

Block A - Drip Only (03-Feb-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.0	6.6	8.3	2.9	6.3	5.4	9.6	13.9	6.5	5.3	10.3	2.9	5.9	6.6	xx
Temp(F)	76	76	76	76	75	74	74	75	75	74	74	74	14	73	xx
% Moisture	12	19	17	18	18	11	18	20	20	20	19	15	19	9	xx

Block B - Drip Only (03-Feb-12)

Eclipse															East
Blk A		W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	2.7	4.1	12.4	7.8	5.0	6.0	7.9	11.3	7.9	6.1	5.8	3.5	6.2	9.7	xx
Temp(F)	75	74	72	73	76	75	74	73	71	69	69	69	70	69	69
% Moisture	12	26	19	21	21	23	21	24	26	24	21	21	22	25	5

Salinity Data - Top 3 inches

www.itrc.org/report/pdf/jdwtAug2012.pdf

Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants

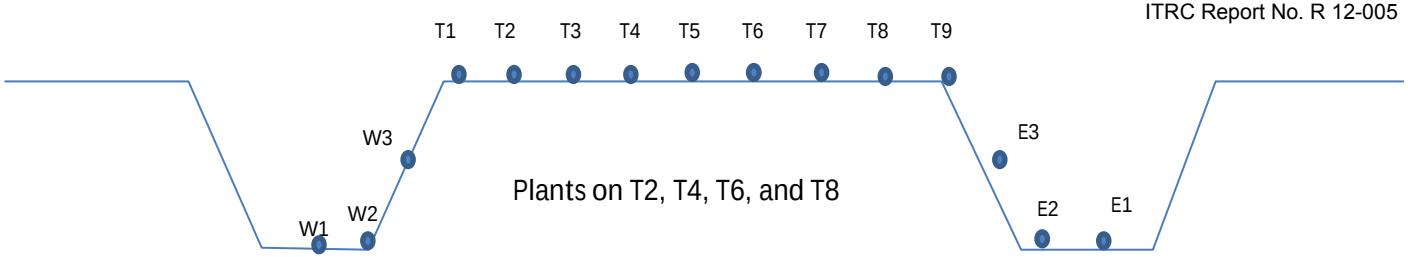
ITRC Report No. R 12-005

Donlon

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (03-12-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	8.93	4.95	2.80	7.85	7.09	7.20	9.10	5.20	6.77	5.10	4.03	5.33	5.54	7.31	9.00
Temp(F)	63.5	62.4	61.0	60.0	60.1	60.1	58.0	59.3	59.7	59.7	59.7	59.7	58.9	59.8	59.7
% Moisture	19.0	23.6	21.1	19.6	21.3	23.8	20.6	18.8	19.7	20.9	21.7	19.8	18.9	19.4	19.5

Block B - Drip Only (03-12-12)

Eclipse															East
Blk A		W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.09	4.81	6.78	4.45	6.00	5.33	5.02	5.46	10.12	4.29	7.04	4.45	7.13	5.38	6.65
Temp(F)	60.6	61.3	61.5	62.9	63.1	62.8	63.0	62.8	62.2	62.2	62.9	62.8	62.5	62.1	61.7
% Moisture	13.7	20.9	21.1	19.9	21.7	21.7	23.8	23.6	22.5	21.3	23.2	22.7	25.9	25.4	13.1

Block A - Drip Only (04-12-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	12.42	9.14	7.88	8.03	5.30	5.07	7.84	9.93	10.22	5.07	4.95	7.38	9.69	5.57	18.04
Temp(F)	63.9	63.7	65.2	67.3	66.9	65.7	65.3	65.3	64.4	64.2	63.7	63.7	63.7	63.1	63.5
% Moisture	34.3	24.6	22.2	21.7	25.1	26.8	24.9	25.7	23.3	25.5	24.6	22.9	25.0	26.8	26.2

Block B - Drip Only (04-12-12)

Eclipse															East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	12.72	5.82	10.18	9.60	9.02	2.49	4.94	5.57	9.84	5.95	6.47	11.30	8.00	9.58	11.92
Temp(F)	66.9	66.4	67.3	67.8	67.6	66.2	64.9	64.2	63.3	63.1	63.0	63.0	62.9	62.2	61.9
% Moisture	22.9	22.8	23.8	23.1	27.9	28.1	25.7	25.8	25.6	27.2	27.3	22.1	28.0	25.0	22.6

Salinity Data - Top 3 inches

www.itrc.org/report/pdf/jdwtAug2012.pdf

Effects of Sprinkler, Partial Sprinkler/Drip, and Drip Only Irrigation on Strawberry Transplants

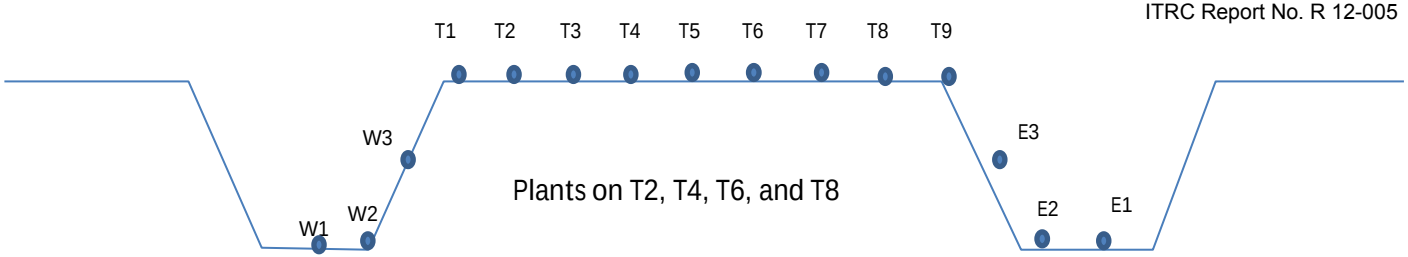
ITRC Report No. R 12-005

Donlon

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (5-3-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	0.49	0.81	3.45	1.46	6.09	6.70	6.84	5.42	9.33	6.89	6.25	2.91	9.49	5.19	4.08
Temp(F)	83.5	84.7	84.4	84.9	84.2	80.9	78.6	77.4	76.8	76.8	75.9	74.8	75.7	76.8	77.9
% Moisture	17.2	18.4	17.2	18.2	24.1	24.6	21.0	20.6	24.1	25.3	24.3	20.6	22.4	25.2	16.9

Block B - Drip Only (5-3-12)

Eclipse															East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	xxx	4.86	6.90	3.34	6.24	6.14	6.40	6.45	7.63	6.03	7.03	5.97	6.62	7.51	xxx
Temp(F)	79.7	80.4	80.6	81.9	82.9	81.1	79.9	78.3	78.1	77.3	76.6	77.5	80.1	82.2	xxx
% Moisture	11.2	21.6	21.1	20.7	22.7	27.9	27.2	22.7	23.2	27.5	26.2	20.1	21.3	22.4	xxx

Block A - Drip Only (6-20-12)

Eclipse	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	5.85	10.10	9.36	5.16	4.37	6.47	8.58	5.28	5.01	3.94	7.55	8.02	5.60	X
Temp(F)	X	82.0	80.2	79.7	78.6	77.2	78.8	77.4	78.4	78.4	78.4	78.6	78.6	78.4	X
% Moisture	X	23.8	22.8	23.1	23.7	21.2	23.1	21.0	22.4	21.7	21.1	19.1	21.3	22.4	X

Block B - Drip Only (6-20-12)

Eclipse															East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	8.57	9.35	7.83	4.36	4.51	6.62	8.29	4.03	5.76	4.86	3.56	5.10	6.75	8.64
Temp(F)	X	75.4	76.3	76.3	76.6	77.0	77.5	77.7	77.7	78.1	78.8	81.1	81.7	82.0	82.8
% Moisture	X	19.4	20.7	20.1	19.9	21.3	21.5	23.7	23.7	21.4	22.0	23.4	25.8	26.8	27.0

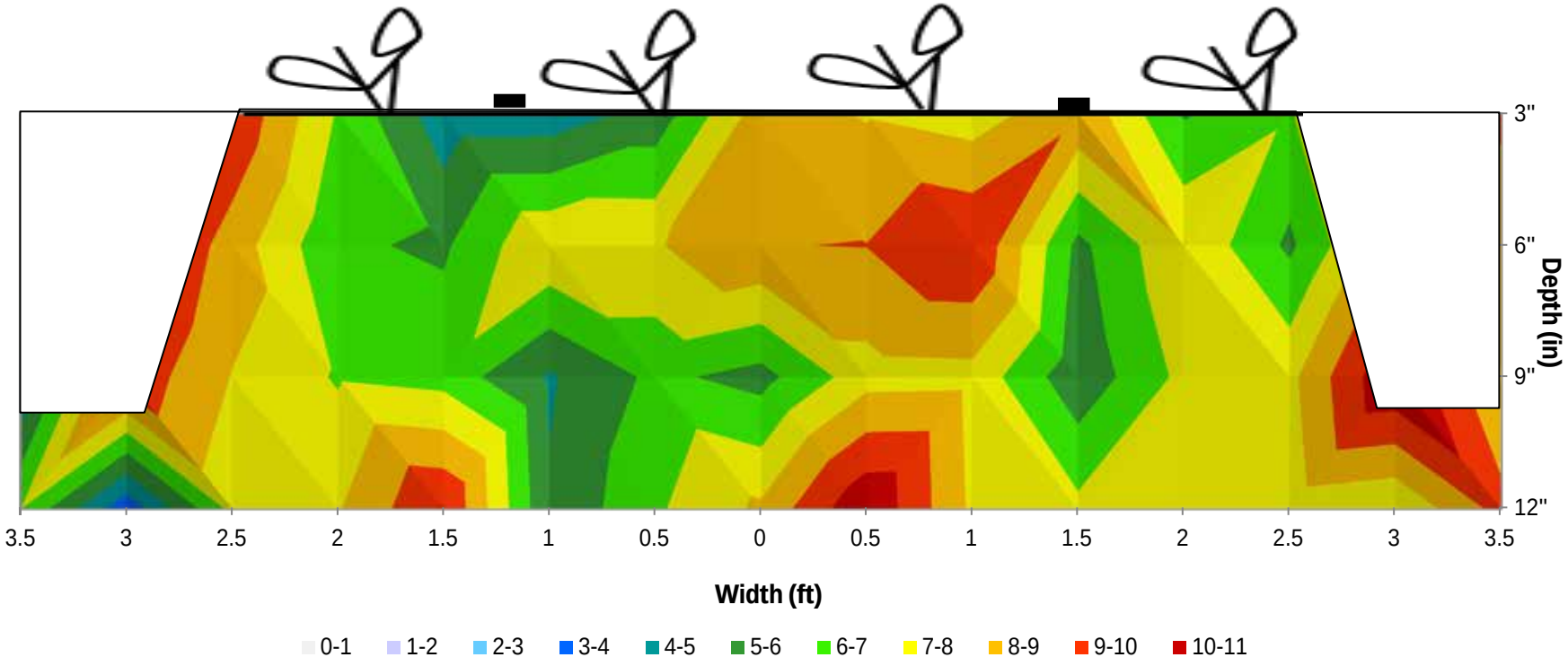
Volumetric Data
Oxnard Area
Donlon

Plant Date: 10/13/11

		2/4 Tape	
	Date	A-Drip	B-Conventional
Starting Meter Reading:	10/1/2011	0.01	1.79
Drip Meter Readings	10/7/2011	0.01	1.79
(Volume in AF)	10/11/2011	0.12	1.90
	11/5/2011	0.21	1.98
	11/27/2011	0.3	2.07
	12/16/2011	0.38	2.15
	1/8/2012	0.47	2.24
	2/3/2012	0.56	2.32
	2/22/2012	0.68	2.44
	3/12/2012	0.83	2.58
	4/11/2012	0.98	2.68
	5/4/2012	1.1	2.84
Volume (AF)	10/7/2011	0.00	0.00
(for the time period)	10/11/2011	0.11	0.11
*Reading - Previous Reading	11/5/2011	0.09	0.08
	11/27/2011	0.09	0.09
	12/16/2011	0.08	0.08
	1/8/2012	0.09	0.09
	2/3/2012	0.09	0.08
	2/22/2012	0.12	0.12
	3/12/2012	0.15	0.14
	4/11/2012	0.15	0.10
	5/4/2012	0.12	0.16
Area (AC)		1.10	1.19
Total Inches applied from drip (IN)	10/7/2011	0.00	0.00
Equation Used:	10/11/2011	1.20	1.11
=[Volume Used (AF) /	11/5/2011	2.19	1.92
Area(AC)]*(12 IN/FT))+Previous Inches	11/27/2011	3.18	2.82
	12/16/2011	4.05	3.63
	1/8/2012	5.04	4.54
	2/3/2012	6.02	5.35
	2/22/2012	7.34	6.56
	3/12/2012	8.98	7.97
	4/11/2012	10.62	8.98
	5/4/2012	11.94	10.59
Sprinkler Estimates	10/7/2011	n/a	n/a
Minutes Operated (MIN)	10/11/2011	n/a	n/a
	11/5/2011	232	232
	11/27/2011	0	0
	12/16/2011	0	0
	1/8/2012	0	0
	2/3/2012	0	0
	2/22/2012	0	0
	3/12/2012	0	0
	4/11/2012	0	0
	5/4/2012	0	0
Total Sprinkler Inches (IN)	10/7/2011	n/a	n/a
	10/11/2011	n/a	n/a
	11/5/2011	0.78	0.78
	11/27/2011	0.78	0.78
	12/16/2011	0.78	0.78
	1/8/2012	0.78	0.78
	2/3/2012	0.78	0.78
	2/22/2012	0.78	0.78
	3/12/2012	0.78	0.78
	4/11/2012	0.78	0.78
	5/4/2012	0.78	0.78
Total Inches (IN)	10/7/2011	0.00	0
	10/11/2011	1.20	1.11
	11/5/2011	2.97	2.69
	11/27/2011	3.95	3.60
	12/16/2011	4.83	4.41
	1/8/2012	5.81	5.32
	2/3/2012	6.80	6.12
	2/22/2012	8.11	7.33
	3/12/2012	9.76	8.75
	4/11/2012	11.40	9.75
	5/4/2012	12.71	11.37
	6/21/2012	0.00	0.00

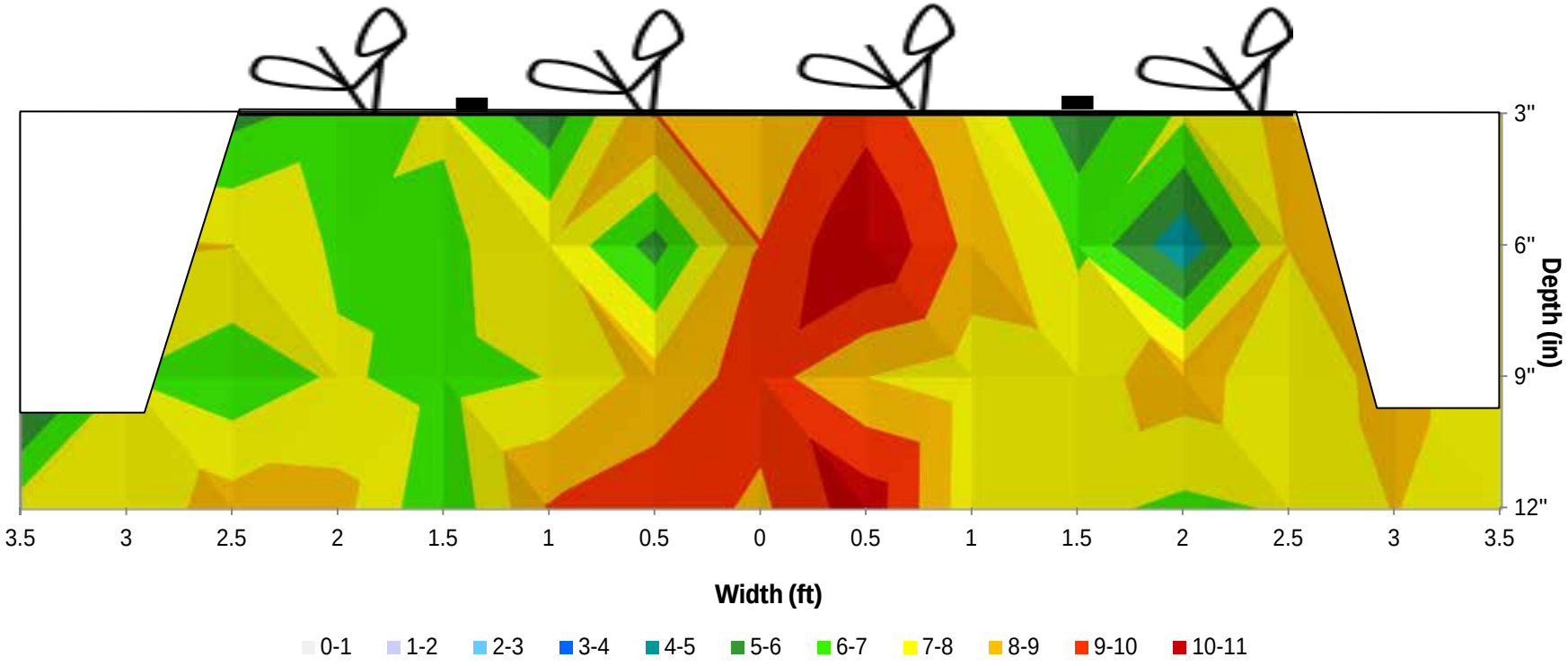
Donlon A Reduced Sprinkler - 2 Tape
EC (dS/m) 3/12/12

Average EC 7.53 dS/m



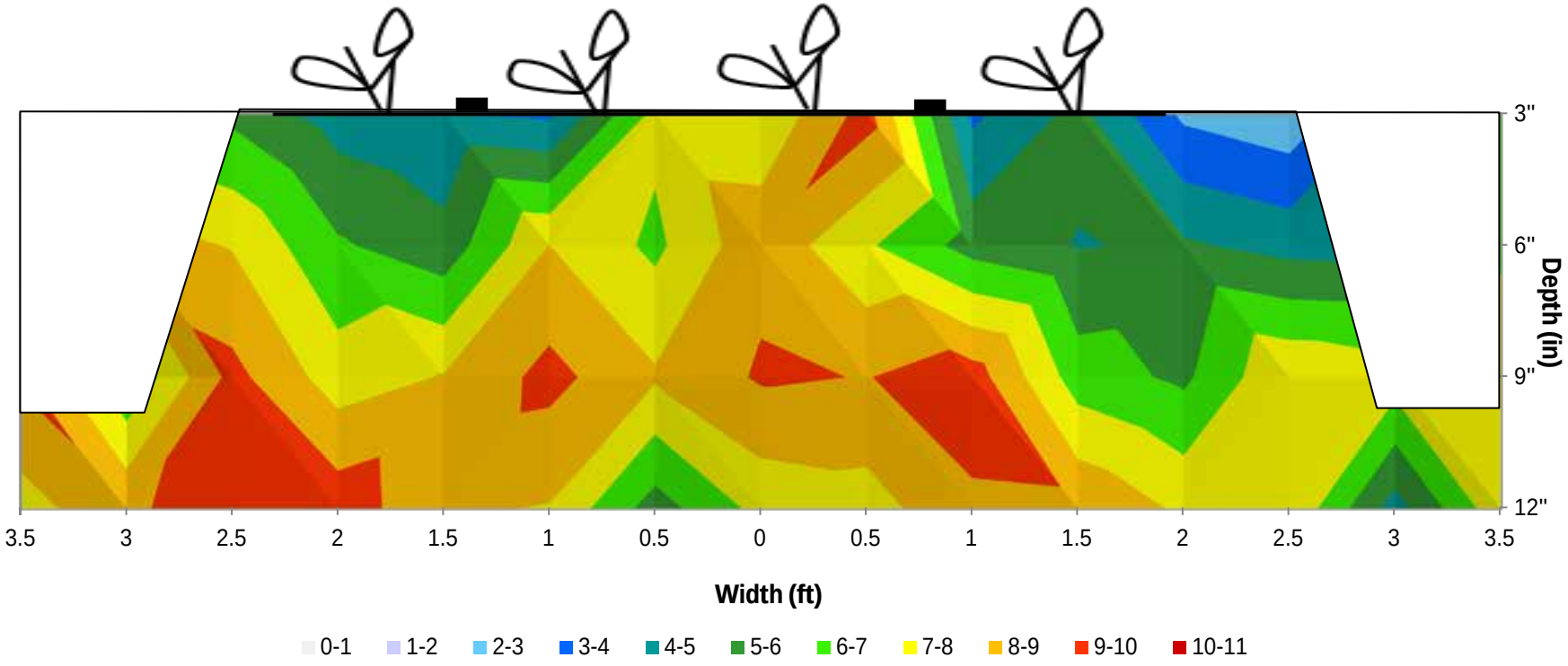
Donlon A Reduced Sprinkler - 2 Tape
EC (dS/m) 5/3/12

Average EC 7.47 dS/m



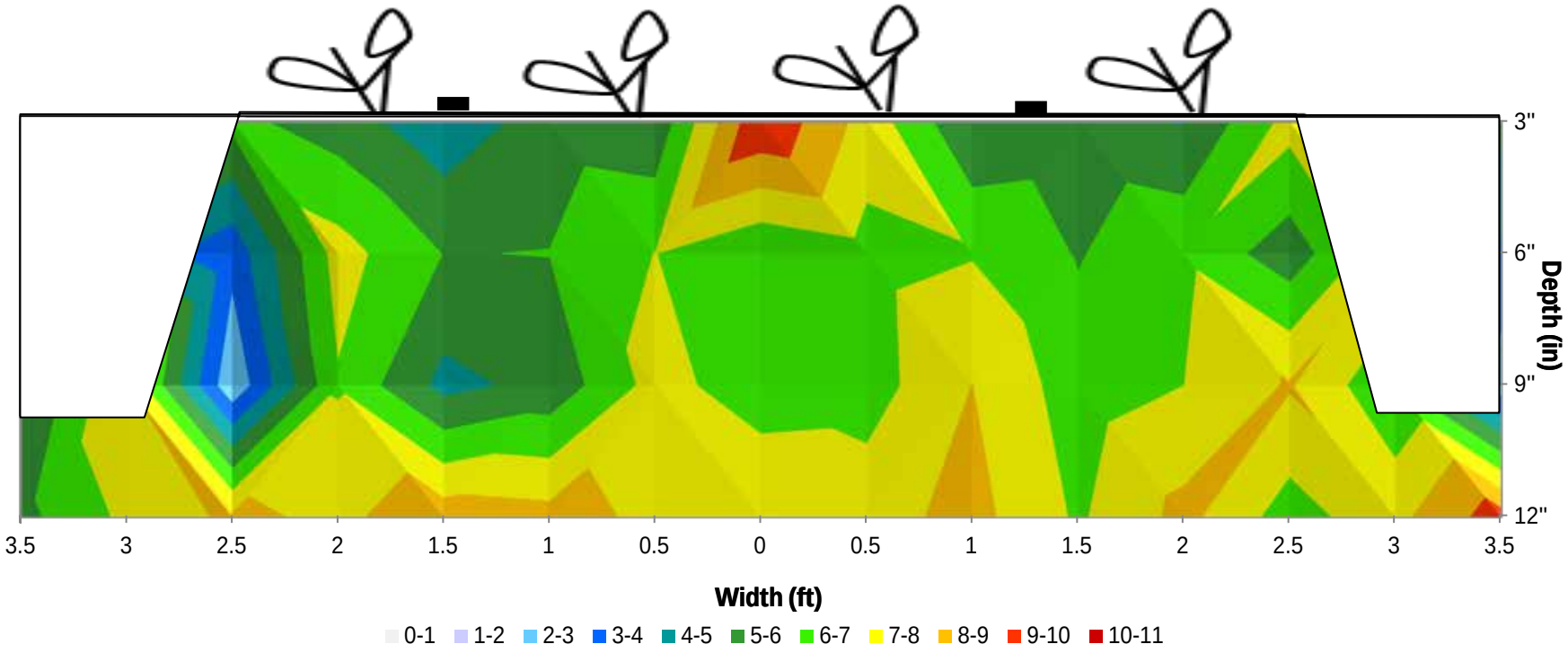
Donlon A Reduced Sprinkler - 2 Tape
EC (dS/m) 6/21/12

Average EC 6.84 dS/m



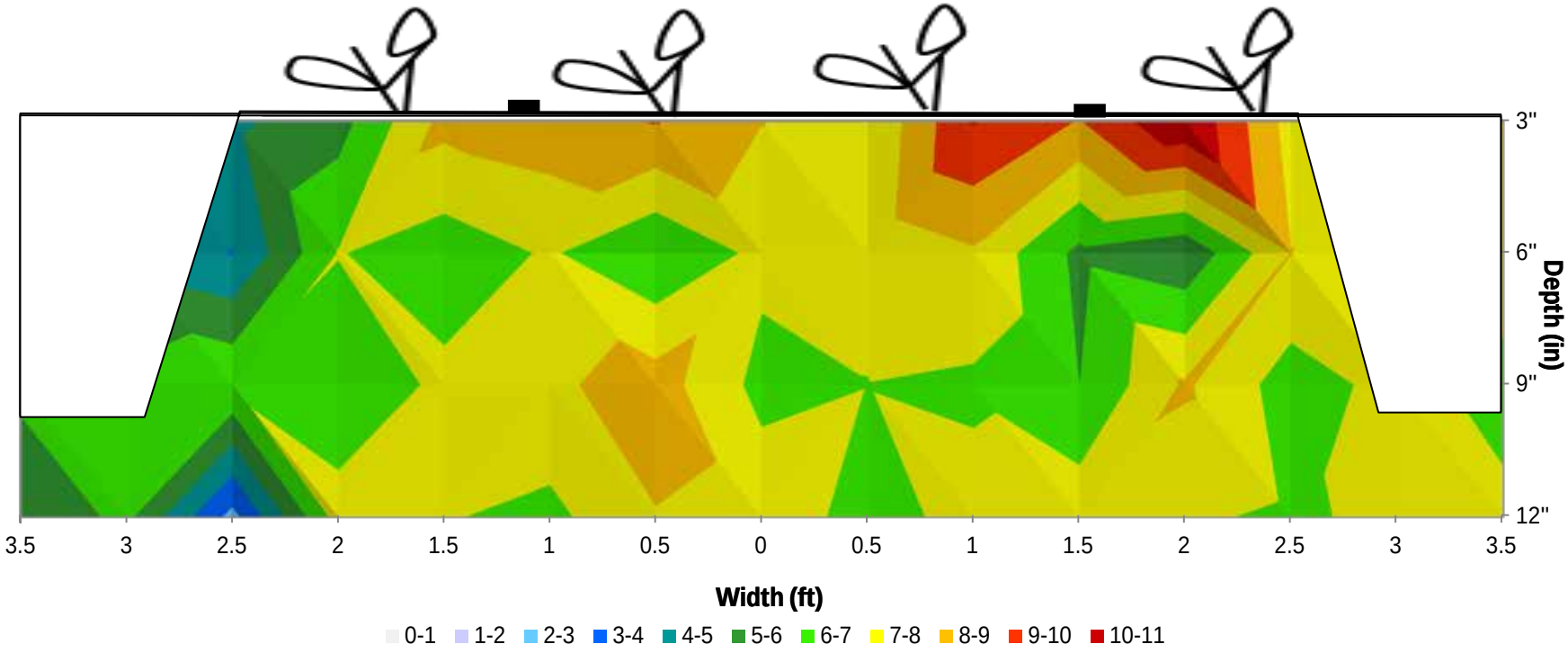
Donlon B Conventional - 2 Tape
EC (dS/m) 3/12/12

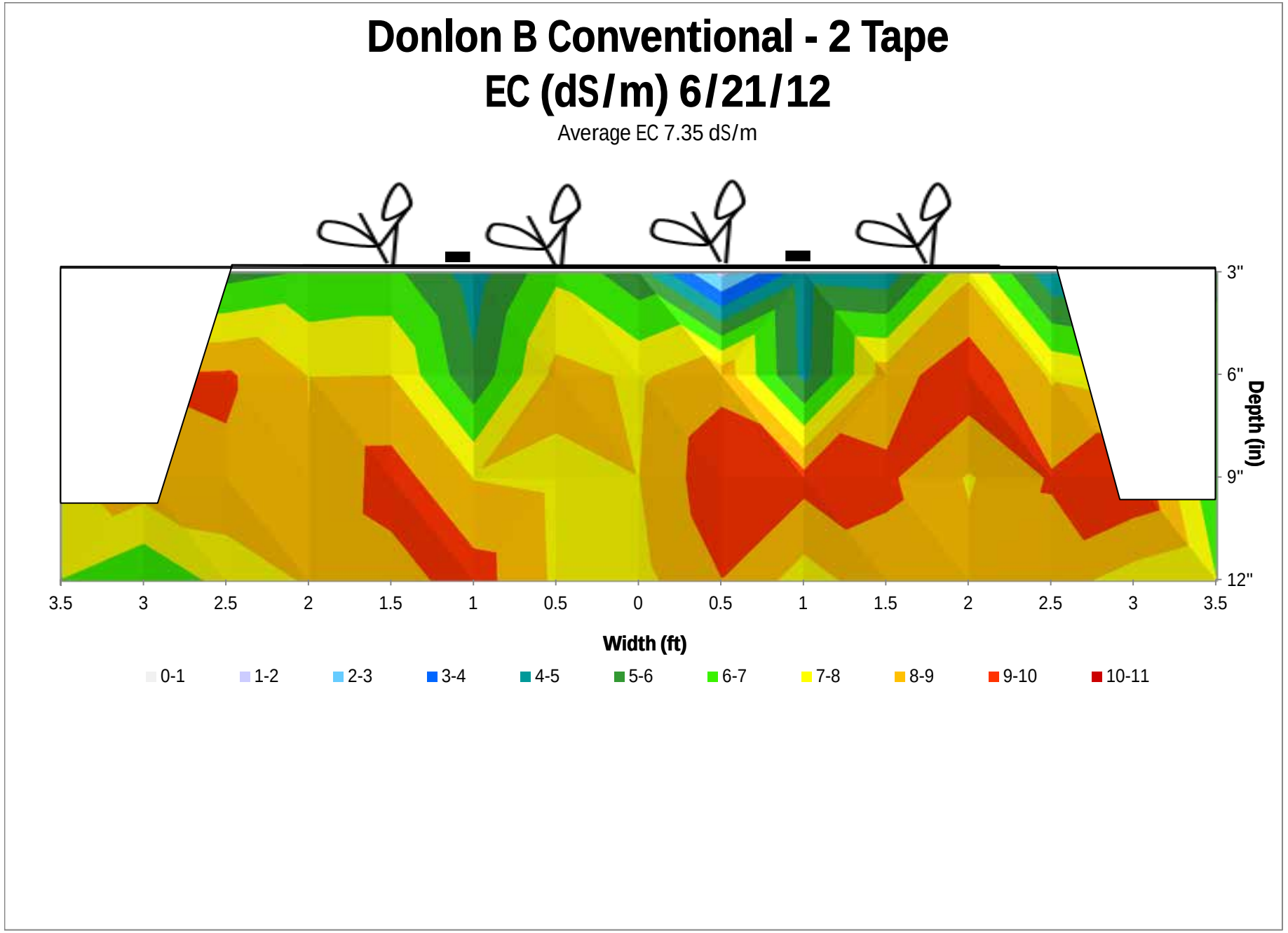
Average EC 6.44 dS/m



Donlon B Conventional - 2 Tape
EC (dS/m) 5/3/12

Average EC 6.96 dS/m




Donlon B Conventional - 2 Tape
EC (dS/m) 6/21/12
Average EC 7.35 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
3.5
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11

Piekert

Peikert - Block A

Reduced Sprinkler

10/22/2011 – 8 DAP

11/5/2011 – 22 DAP

11/27/2011 – 44 DAP

12/16/2011 – 63 DAP

Peikert - Block A

Reduced Sprinkler

1/12/2012 – 90 DAP

2/03/2012 – 112 DAP

2/21/2012 – 130 DAP

3/12/2012 – 150 DAP

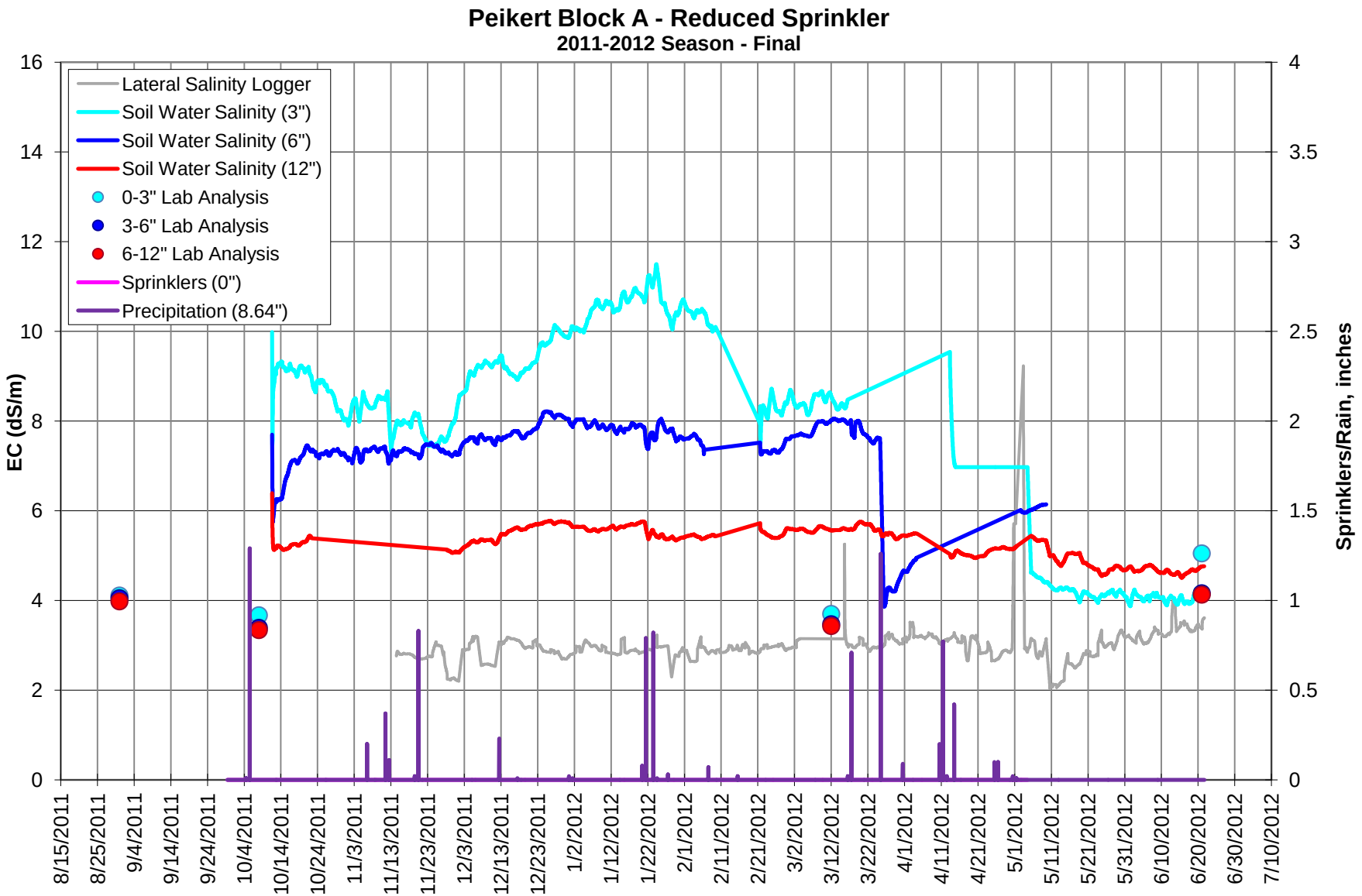
Peikert - Block A

Reduced Sprinkler

4/12/2012 – 181 DAP

5/4/2012 – 203 DAP

6/21/2012 – 221 DAP


Peikert Block A - Reduced Sprinkler
2011-2012 Season - Final
Lateral Salinity Logger
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (0")
Precipitation (8.64")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
8/15/2011
8/25/2011
9/4/2011
9/14/2011
9/24/2011
10/4/2011
10/14/2011
10/24/2011
11/3/2011
11/13/2011
11/23/2011
12/3/2011
12/13/2011
12/23/2011
1/2/2012
1/12/2012
1/22/2012
2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012

Peikert - Block B

Conventional

10/22/2011 – 11 DAP

11/5/2011 – 25 DAP

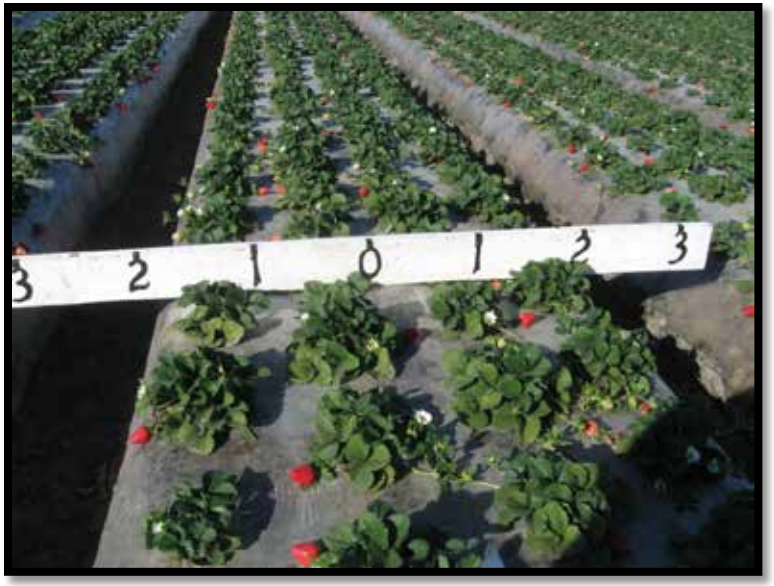
11/27/2011 – 47 DAP

12/16/2011 – 66 DAP

Peikert - Block B

Conventional

2/03/2012 – 115 DAP



2/21/2012 – 93 DAP

3/12/2012 – 115 DAP

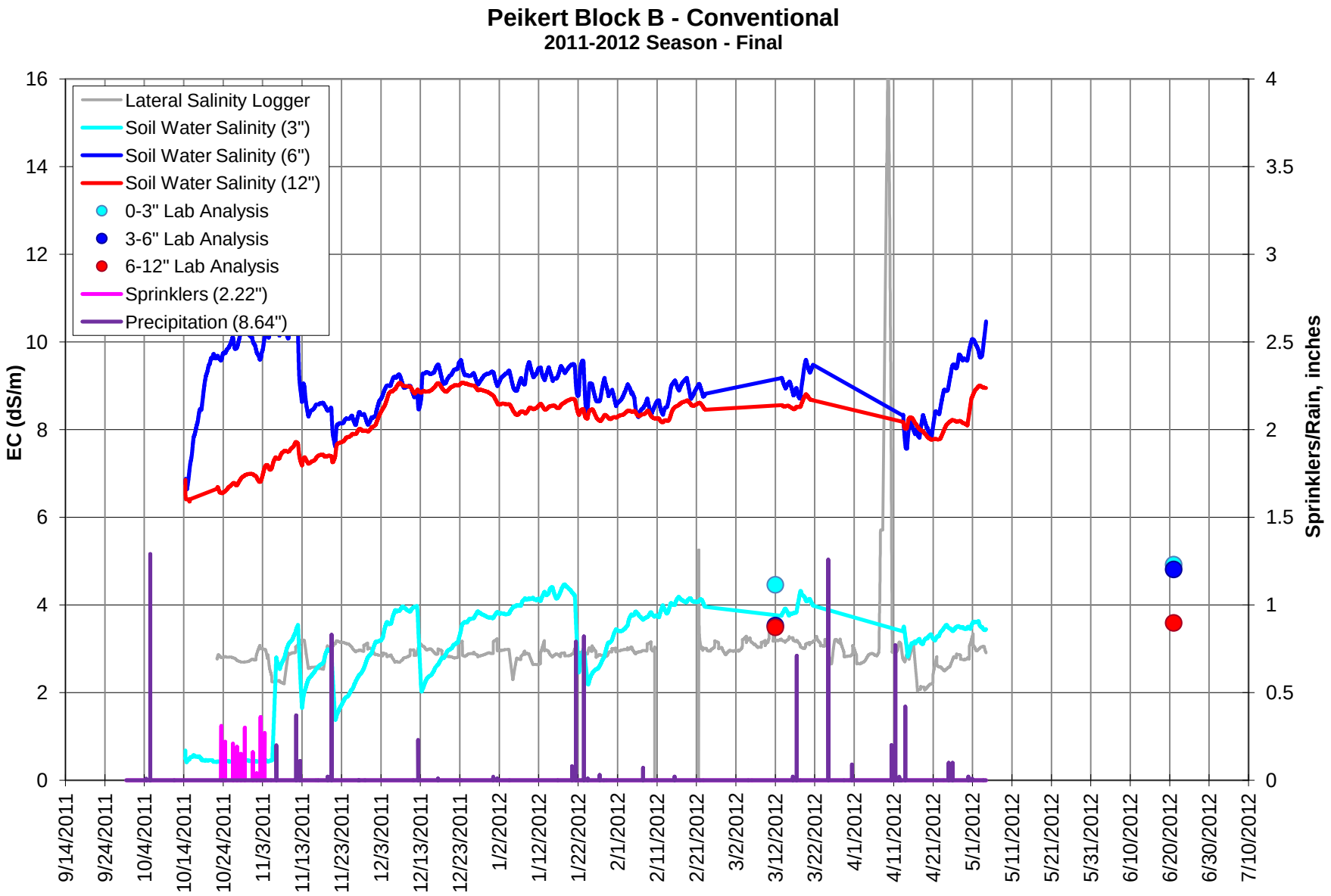
4/12/2012 – 146 DAP

Peikert - Block B

Conventional

5/4/2012 – 168 DAP

6/21/2012 – 216 DAP


Peikert Block B - Conventional
2011-2012 Season - Final
Lateral Salinity Logger
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (2.22")
Precipitation (8.64")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
9/14/2011
9/24/2011
10/4/2011
10/14/2011
10/24/2011
11/3/2011
11/13/2011
11/23/2011
12/3/2011
12/13/2011
12/23/2011
1/2/2012
1/12/2012
1/22/2012
2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Piekert Blocks

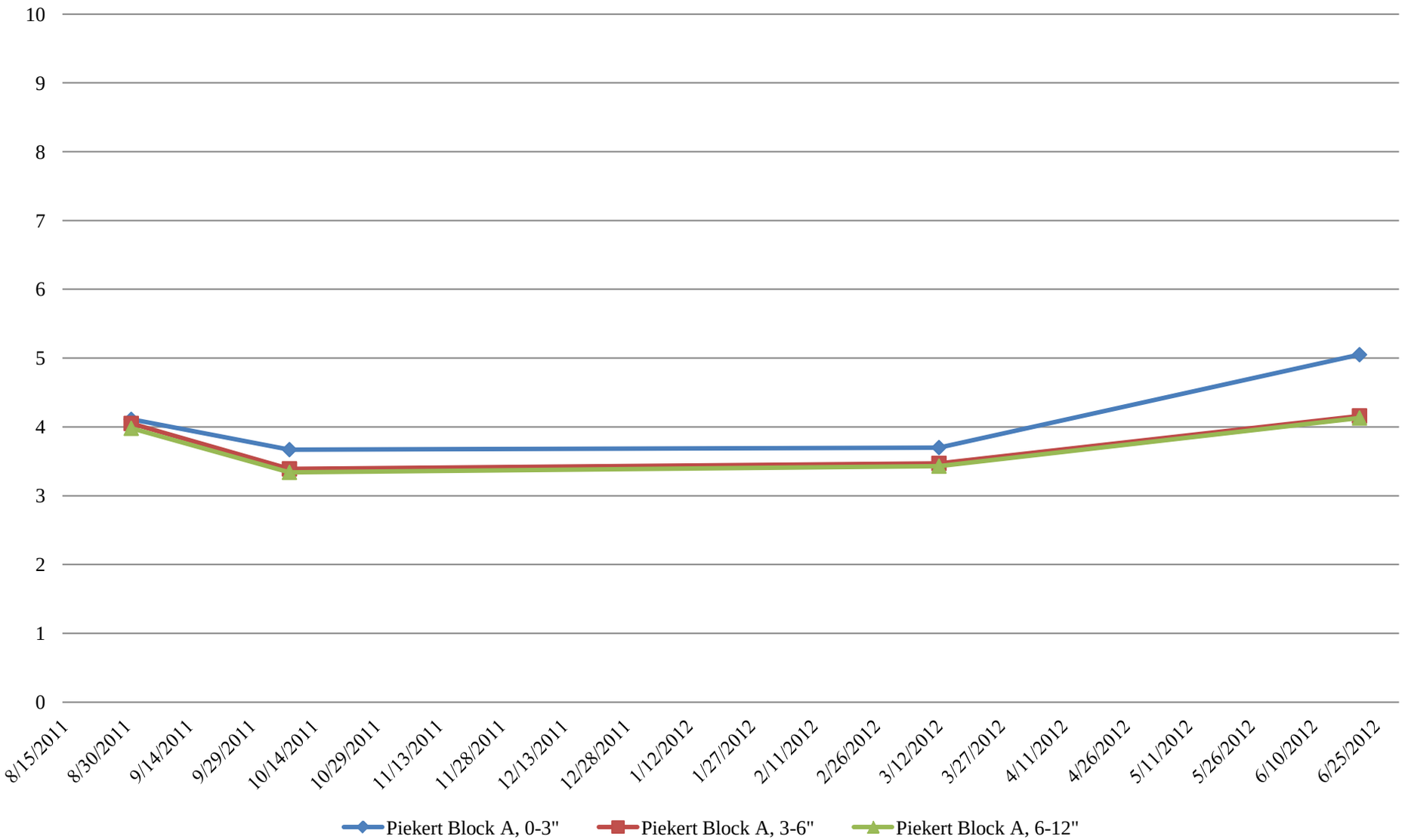
ITRC Report No. R 12-005

Date:		8/31/2011			10/8/2011			3/12/2012			6/21/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	4.11	191.10	DLS	3.67	108.15	DLS	3.70	70.00	DLS	5.05	262.85
	3-6"	DLS	4.05	189.70	DLS	3.39	50.40	DLS	3.47	73.50	DLS	4.16	166.60
	6-12"	DLS	3.98	170.80	DLS	3.34	42.35	DLS	3.43	30.80	DLS	4.13	111.65
Block B	0-3"	SSS			SSS			SSS	4.46	77.70	SSS	4.92	263.90
	3-6"	SSS			SSS			SSS	3.53	49.70	SSS	4.81	242.20
	6-12"	SSS			SSS			SSS	3.49	45.50	SSS	3.59	57.05

Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

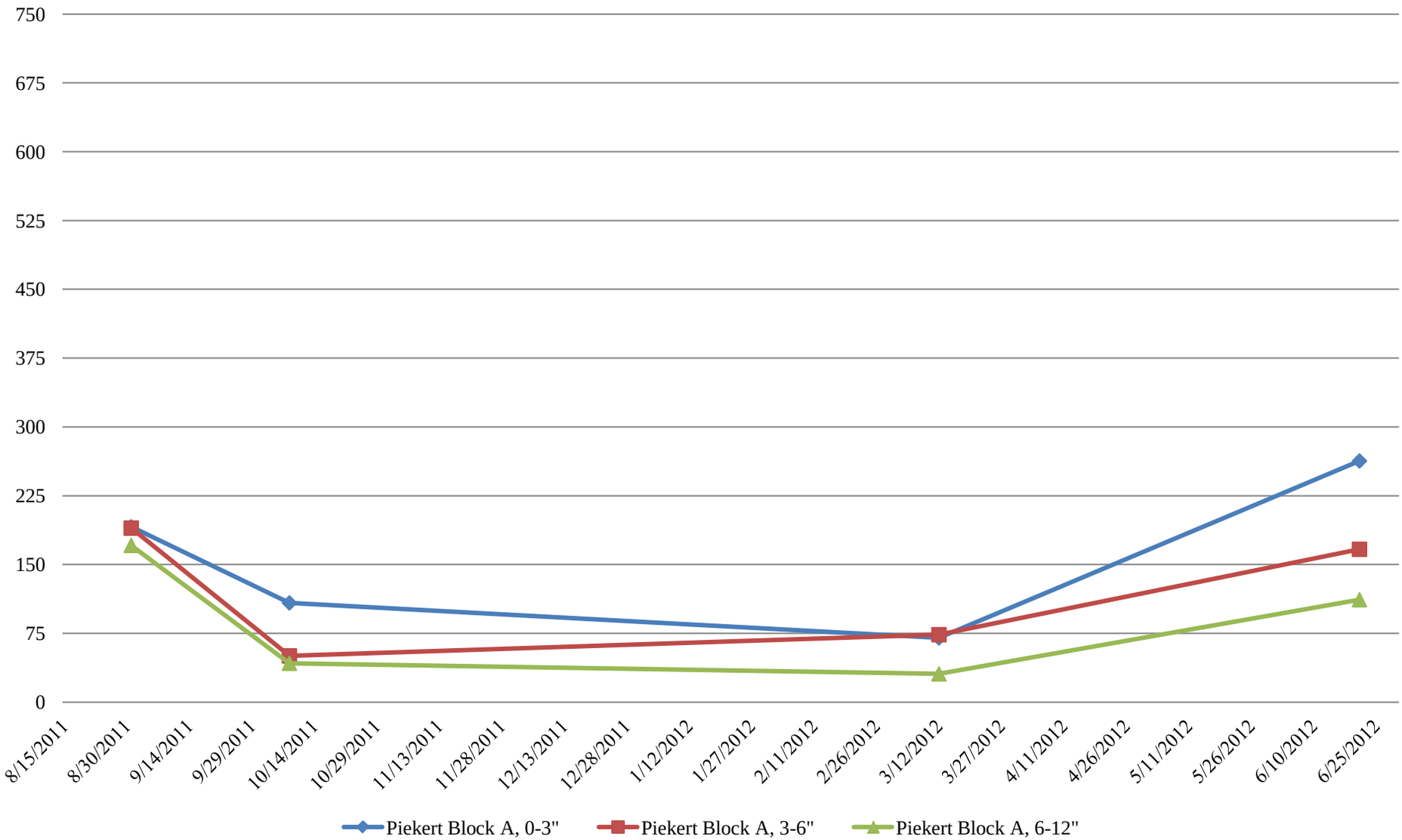
Piekert Block A

Salinity



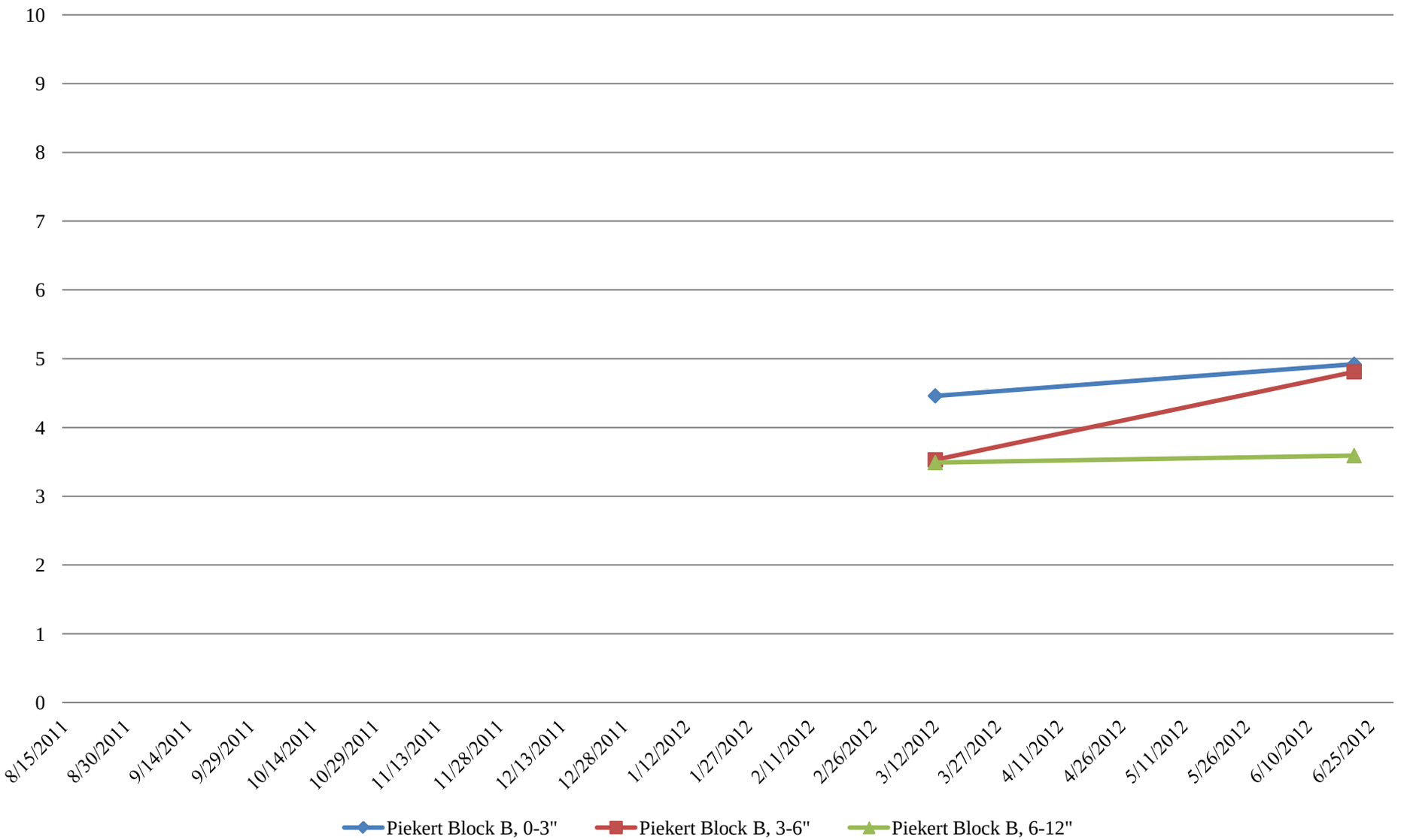
Piekert Block A

Chloride



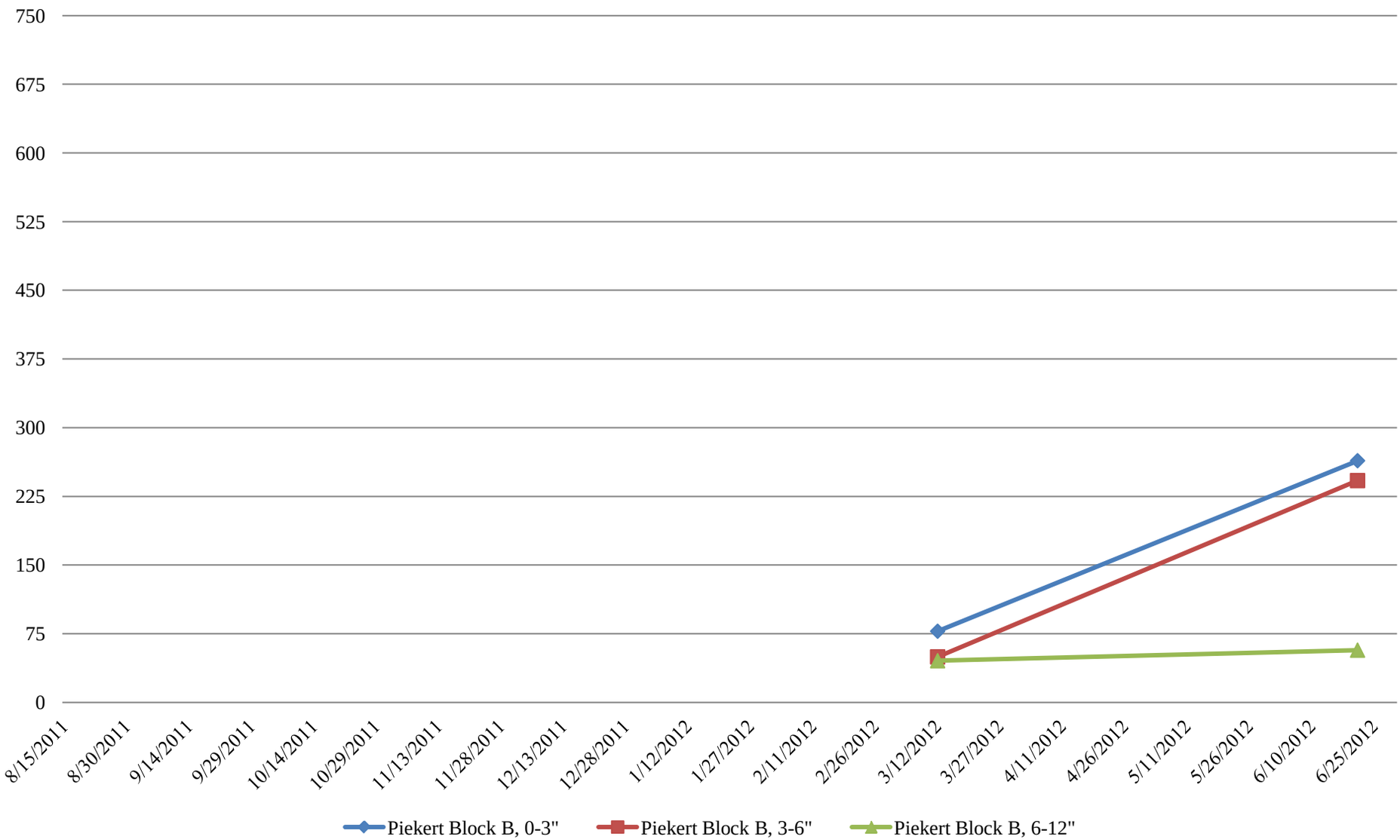
Piekert Block B

Salinity



Piekert Block B

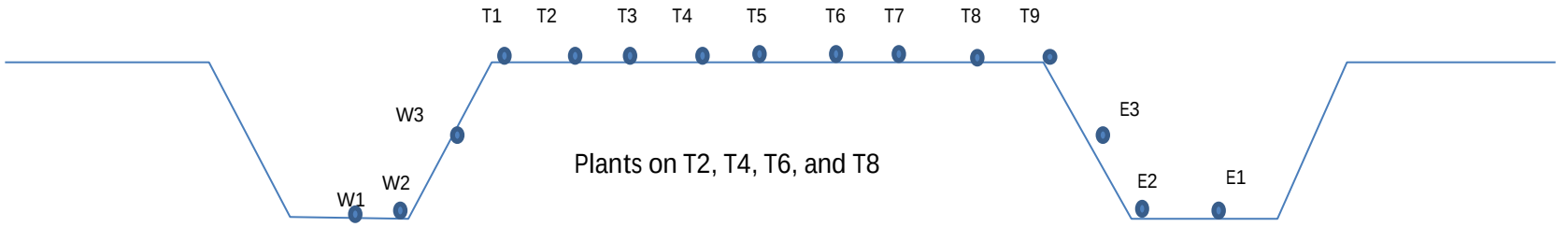
Chloride



Salinity Data - Top 3 inches

Peikert
7-Oct-11
Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (07-Oct-11)

Donlon	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.2	3.9	11.8	8.5	11.6	1.8	2.1	1.0	6.1	4.6	6.8	0.5	6.5	5.3	5.3
% Moisture	22	30	24	24	30	25	20	20	18	26	23	17	35	26	32

Block B - Partcial Sprinkler (07-Oct-11)

Peikert	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.6	3.0	6.9	3.5	4.3	6.0	8.7	3.1	6.4	8.5	7.6	5.1	9.4	4.3	9.4
% Moisture	20	31	26	27	22	28	25	25	25	25	24	24	23	26	25

Block A - Drip Only (22-Oct-11)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	9.1	9.1	12.7	6.0	5.6	5.91	11.6	1.9	9.8	7.6	10.5	5.2	19.9	9.53	10.6
Temp(F)	70	71	72	73	73	73.8	74	73	23	72	71	71	69.8	69.3	70
% Moisture	35	30	24	24	28	28.3	23	23	26	24	17	18	10.12	27	28

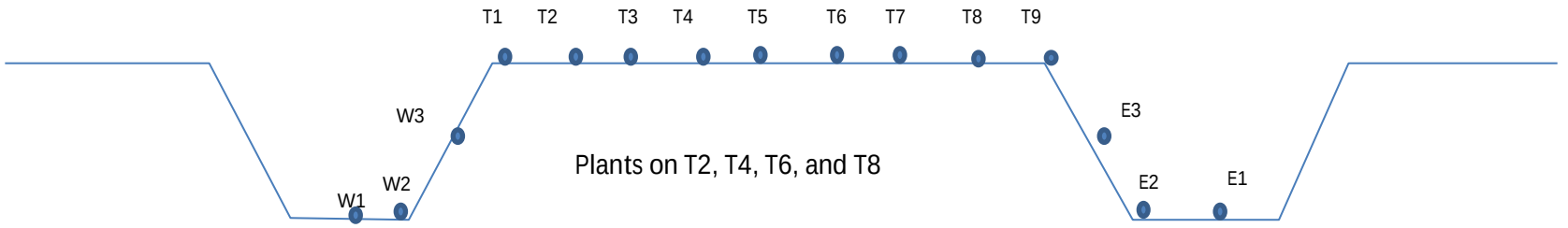
Block B - Drip Only (22-Oct-11)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	11.9	4.4	11.4	2.6	6.8	6.3	5.1	6.5	6.1	7.6	5.2	4.1	5.1	7.8	8.8
Temp(F)	65	66	66	66	67	68	70	71	71	72	72	72	70	71	72
% Moisture	26	70	22	18	23	23	23	24	21	24	27	21	32	26	32

Salinity Data - Top 3 inches

Peikert
7-Oct-11
Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (05-Nov-11)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	6.4	4.0	6.8	10.6	10.4	5.95	7.7	11.4	8.3	5.4	5.1	11.0	7.18	6.03	4.1
Temp(F)	56	56	56	56	57.34	59.2	61	64	65	66	68	70	73.1	75.4	73
% Moisture	33	36	28	16	23.7	23.1	28	26	28	30	28	25	27.6	35.6	4

Block B - Drip Only (05-Nov-11)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	6.4	5.9	6.1	6.4	4.1	7.4	7.2	1.7	2.1	4.4	6.7	9.0	3.4	4.7	5.0
Temp(F)	62	60	59	59	57	62	64	65	66	65	66	67	70	73	72
% Moisture	32	35	27	21	23	29	26	22	32	30	27	28	27	34	39

Block A - Drip Only (27-Nov-11)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.5	4.7	2.3	8.4	7.77	3.75	8.1	11.8	5.4	8.3	6.3	9.9	7.88	8.45	2.4
Temp(F)	64	63	62	61	60.6	60.4	60	61	61	62	62	63	65.7	67.8	67
% Moisture	21	28	28	18	19.5	23.2	23	30	23	23	23	23	29	28.5	22

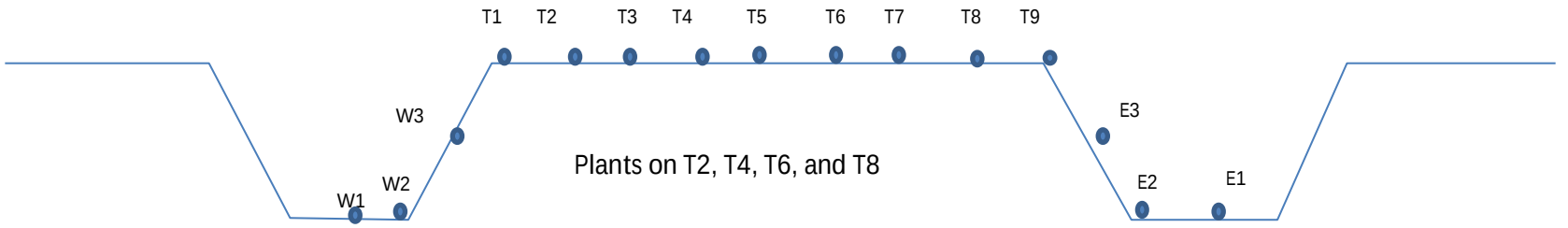
Block B - Drip Only (27-Nov-11)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	0.5	3.7	4.4	8.0	6.5	12.9	6.5	5.7	4.8	6.5	3.9	4.9	12.3	6.0	4.4
Temp(F)	61	60	60	60	60	60	60	61	61	62	63	64	66	68	68
% Moisture	18	28	28	18	27	21	28	22	23	22	26	18	25	34	24

Salinity Data - Top 3 inches

Peikert
7-Oct-11
Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (16-Dec-11)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	4.0	2.7	11.6	5.3	7.27	3.54	16.0	7.8	5.8	12.6	9.3	17.5	4.37	11.82	8.0
Temp(F)	61	61	61	61	62.1	62.6	63	64	63	62	62	62	62.8	63.5	64
% Moisture	23	24	17	18	20.1	23.9	27	20	15	14	17	19	19.4	25.3	25

Block B - Drip Only (16-Dec-11)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	2.6	6.1	7.8	3.1	16.9	6.1	7.4	8.3	8.8	5.4	8.7	1.9	0.8	12.5	6.5
Temp(F)	66	67	67	66	65	66	66	67	68	68	68	68	68	69	69
	23	19	18	15	18	18	18	19	28	11	22	13	19	20	24

Block A - Drip Only (8-Jan-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	4.8	5.1	13.8	8.2	11	10.2	9.5	8.7	4.3	7.4	7.1	7.1	11.6	1.8	5.0
Temp(F)	59	58	59	60	61	61.2	62	62	61	61	61	61	61	61	60
% Moisture	11	22	23	22	23.8	21.8	23	19	20	18	16	16	19.6	19	18

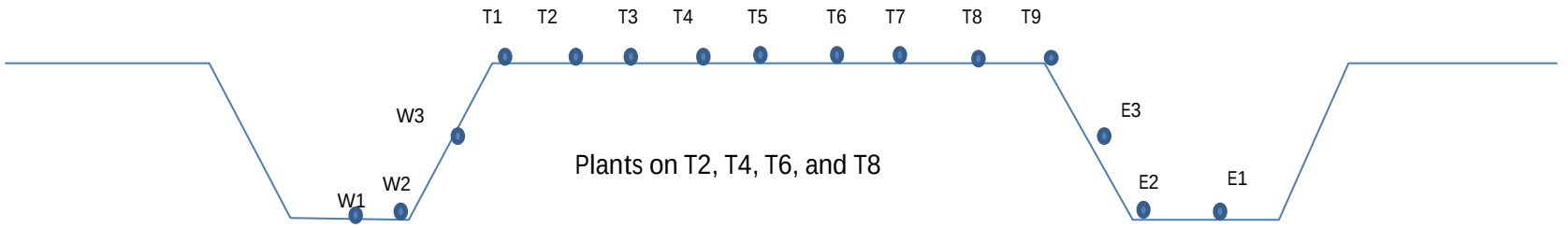
Block B - Drip Only (8-Jan-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	8.7	5.0	8.7	8.4	6.4	9.7	3.3	8.7	9.4	11.0	9.3	8.5	13.4	13.8	8.7
Temp(F)	59	59	59	59	59	60	60	60	59	59	59	59	59	60	60
	24	21	12	19	24	24	23	25	23	22	19	20	20	21	22

Salinity Data - Top 3 inches

Peikert
7-Oct-11
Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (4-Feb-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	xx	4.8	5.0	8.3	5.81	13.29	10.1	10.6	12.8	9.2	9.1	8.4	12.9	1.9	x
Temp(F)	xx	73	73	75	75.6	75.6	75	75	74	74	73	72	72	71	60
% Moisture	xx	20	17	23	22.4	20.4	28	28	22	18	18	18	18	18	18

Block B - Drip Only (4-Feb-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	xx	8.46	7.00	9.63	8.10	2.40	9.80	1.60	11.00	7.07	7.16	6.80	2.92	3.67	xx
Temp(F)	xx	71.4	72.0	74.1	75.0	75.0	75.0	75.7	25.0	26.0	75.4	75.0	74.0	73.2	xx
	xx	15.4	17.0	18.7	22.6	18.0	24.0	15.8	21.4	22.0	19.6	23.0	24.5	22.0	xx

Block A - Drip Only (03-12-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.02	6.05	6.12	2.69	3.23	4.98	5.35	9.01	10.63	8.50	6.61	3.46	7.54	6.38	X
Temp(F)	71.4	72.1	73.4	75.4	75.9	75.0	75.0	75.2	74.8	76.1	77.4	78.4	77.7	77.2	77.4
% Moisture	12.1	28.0	23.9	21.8	22.7	14.5	26.1	27.8	28.2	26.1	28.0	26.5	24.4	30.7	17.0

Block B - Drip Only (03-12-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	3.65	6.58	7.03	7.15	6.05	4.59	2.53	2.24	5.89	5.75	8.57	11.20	7.38	X
Temp(F)	75.0	75.7	75.9	76.8	77.0	7.7	78.1	77.7	76.6	76.1	75.2	75.6	76.6	76.8	77.2
% Moisture	9.2	27.3	29.9	35.1	31.8	22.5	28.5	27.2	27.9	28.9	31.4	34.5	30.2	30.0	11.7

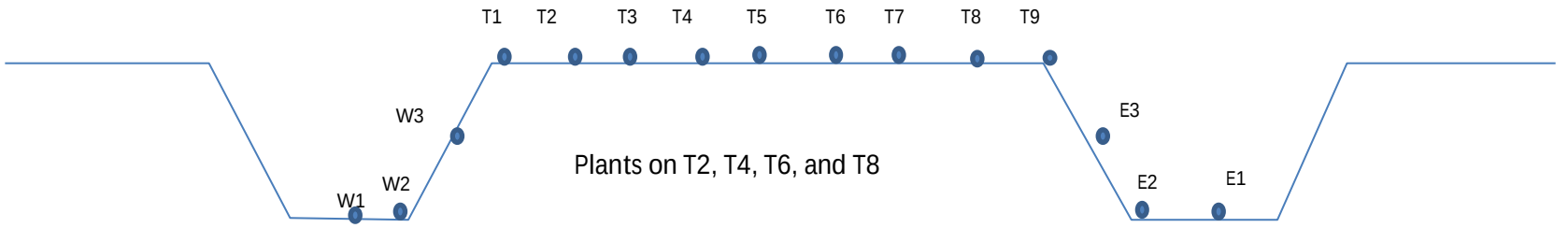
Salinity Data - Top 3 inches

Peikert

7-Oct-11

Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (04-12-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	4.64	6.01	5.38	8.33	5.02	2.41	6.74	5.54	5.66	9.76	3.97	5.90	5.66	X
Temp(F)	X	59.7	60.8	61.9	62.4	62.9	62.4	62.1	61.9	61.1	61.7	61.5	61.3	61.7	X
% Moisture	X	36.6	35.6	31.0	37.2	36.6	27.3	28.3	31.6	32.3	32.2	32.3	31.8	34.7	X

Block B - Drip Only (04-12-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	12.24	13.51	7.25	5.23	9.23	11.17	5.95	10.87	5.85	7.28	7.01	7.54	7.36	X
Temp(F)	X	59.9	60.4	60.6	61.0	61.2	61.3	60.8	61.0	61.2	61.5	61.5	61.3	61.2	X
% Moisture	X	27.5	28.5	30.5	27.1	31.3	26.8	27.2	26.7	31.2	28.0	34.4	32.0	32.6	X

Block A - Drip Only (5-4-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	xxx	6.72	5.91	2.17	4.21	5.75	7.14	8.47	7.16	5.56	8.44	2.01	7.88	6.19	7.42
Temp(F)	xxx	85.6	86.7	88.0	87.6	86.2	84.9	84.4	82.0	82.0	81.9	81.9	80.4	78.4	76.8
% Moisture	xxx	26.9	25.0	23.1	23.5	25.1	24.4	28.6	25.4	25.2	28.9	28.5	26.1	36.8	28.2

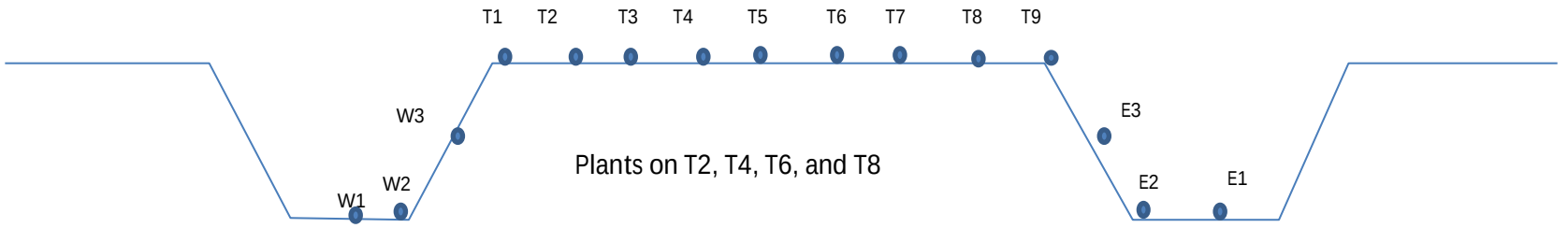
Block B - Drip Only (5-4-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	0.31	8.50	8.13	9.85	10.15	10.00	3.82	8.31	9.35	4.60	7.00	6.15	2.89	7.78	2.48
Temp(F)	73.2	74.1	76.8	79.9	82.2	80.6	73.2	77.9	75.6	75.0	74.3	73.8	73.4	73.0	72.9
% Moisture	16.1	25.7	22.4	23.7	26.7	23.7	23.9	27.5	22.1	22.9	23.9	22.0	22.8	25.6	17.8

Salinity Data - Top 3 inches

Peikert
7-Oct-11
Using 5TE Sensor and ProCheck

Salinity +8



Block A - Drip Only (6-21-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	8.24	4.27	4.88	5.09	8.19	7.04	2.15	7.64	6.33	4.70	4.45	8.35	6.05	X
Temp(F)	X	74.1	74.8	75.7	75.7	75.0	74.9	75.0	752.0	74.8	74.7	75.2	75.7	76.1	X
% Moisture	X	25.4	21.5	21.1	18.3	18.5	22.9	19.0	14.6	24.2	18.6	15.2	16.2	18.2	X

Block B - Drip Only (6-21-12)

Peikert	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	8.48	4.60	6.99	3.40	5.29	7.82	9.95	8.75	3.18	7.60	4.60	1.20	X	X
Temp(F)	X	75.6	75.2	75.0	75.0	75.2	75.6	75.7	75.9	76.1	76.5	76.5	76.1	X	X
% Moisture	X	23.3	20.9	22.5	23.8	20.7	23.2	27.9	22.3	21.0	19.7	15.9	16.0	X	X

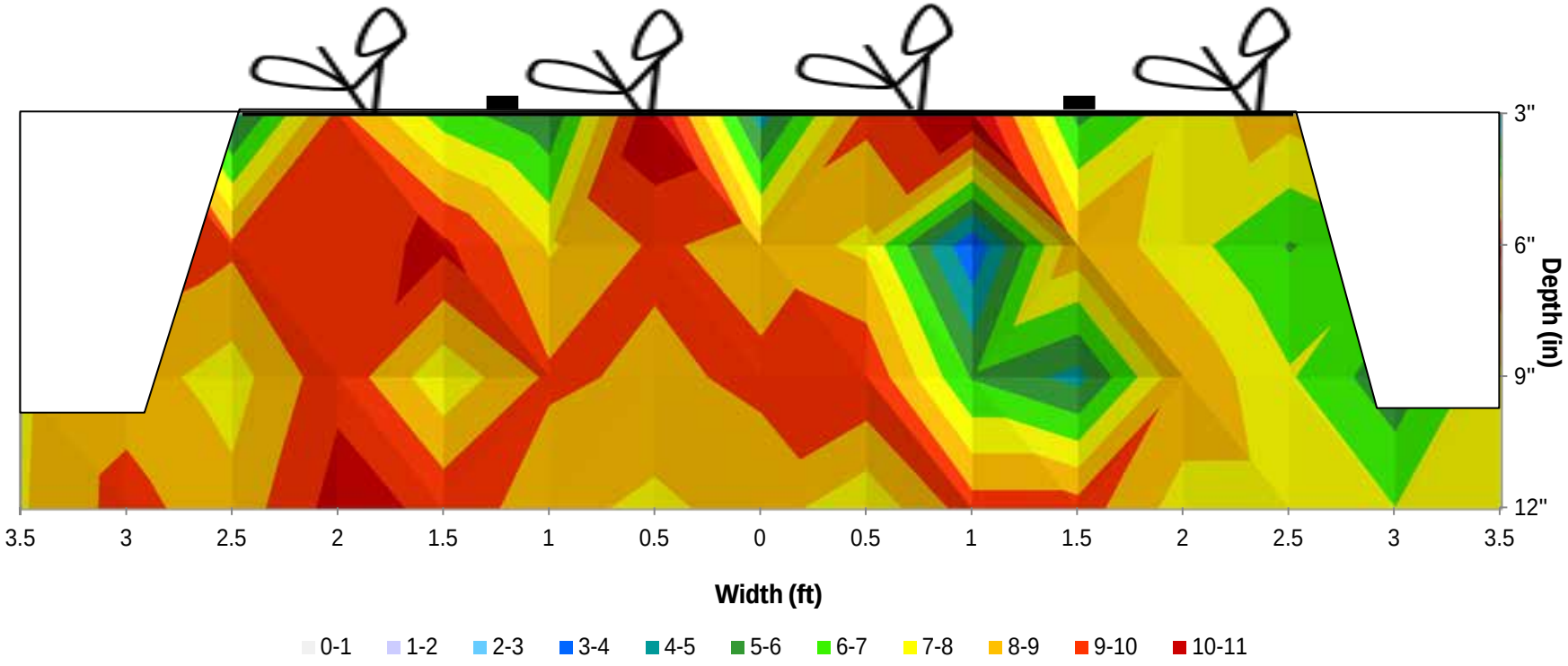
Volumetric Data
Oxnard Area
Peikert

Plant Date: *Block A* 10/14/11 *Block B* 10/11/11

		4 Tape	
	Date	A-Reduced	B-Conventional
Starting Meter Reading:	10/1/2011	16.14	10.75
Drip Meter Readings	10/7/2011	16.14	10.75
(Volume in AF)	10/11/2011	16.18	10.80
	11/5/2011	16.23	10.85
	11/27/2011	16.30	10.94
	12/16/2011	16.38	11.03
	1/8/2012	16.48	11.17
	2/3/2012	16.59	11.36
	2/22/2012	16.67	11.4
	3/12/2012	16.79	11.55
	4/11/2012	16.97	11.73
	5/4/2012	17.11	11.88
Volume (AF)	10/7/2011	0.00	0.00
(for the time period)	10/11/2011	0.04	0.05
*Reading - Previous Reading	11/5/2011	0.05	0.05
	11/27/2011	0.07	0.09
	12/16/2011	0.08	0.09
	1/8/2012	0.10	0.14
	2/3/2012	0.11	0.19
	2/22/2012	0.08	0.04
	3/12/2012	0.12	0.15
	4/11/2012	0.18	0.18
	5/4/2012	0.14	0.15
Area (AC)		1.06	1.15
Total Inches applied from drip (IN)	10/7/2011	0.00	0.00
Equation Used:	10/11/2011	0.45	0.52
=[Volume Used (AF) /	11/5/2011	1.02	1.04
Area(AC)]*(12 IN/FT))+Previous Inches	11/27/2011	1.81	1.98
	12/16/2011	2.72	2.92
	1/8/2012	3.85	4.38
	2/3/2012	5.09	6.37
	2/22/2012	6.00	6.78
	3/12/2012	7.36	8.35
	4/11/2012	9.40	10.23
	5/4/2012	10.98	11.79
Sprinkler Estimates	10/7/2011	0.00	0.00
Minutes Operated (MIN)	10/11/2011	0	0
	11/5/2011	0	664
	11/27/2011	0	0
	12/16/2011	0	0
	1/8/2012	0	0
	2/3/2012	0	0
	2/22/2012	0	0
	3/12/2012	0	0
	4/11/2012	0	0
	5/4/2012	0	0
Total Sprinkler Inches (IN)	10/7/2011	0.00	0.00
	10/11/2011	0.00	0.00
	11/5/2011	0.00	2.22
	11/27/2011	0.00	2.22
	12/16/2011	0.00	2.22
	1/8/2012	0.00	2.22
	2/3/2012	0.00	2.22
	2/22/2012	0.00	2.22
	3/12/2012	0.00	2.22
	4/11/2012	0.00	2.22
	5/4/2012	0.00	2.22
Total Inches (IN)	10/7/2011	0.00	0.00
	10/11/2011	0.45	0.52
	11/5/2011	1.02	3.26
	11/27/2011	1.81	4.20
	12/16/2011	2.72	5.14
	1/8/2012	3.85	6.60
	2/3/2012	5.09	8.59
	2/22/2012	6.00	9.00
	3/12/2012	7.36	10.57
	4/11/2012	9.40	12.45
	5/4/2012	10.98	14.01
	5/5/2012	0.00	0.00

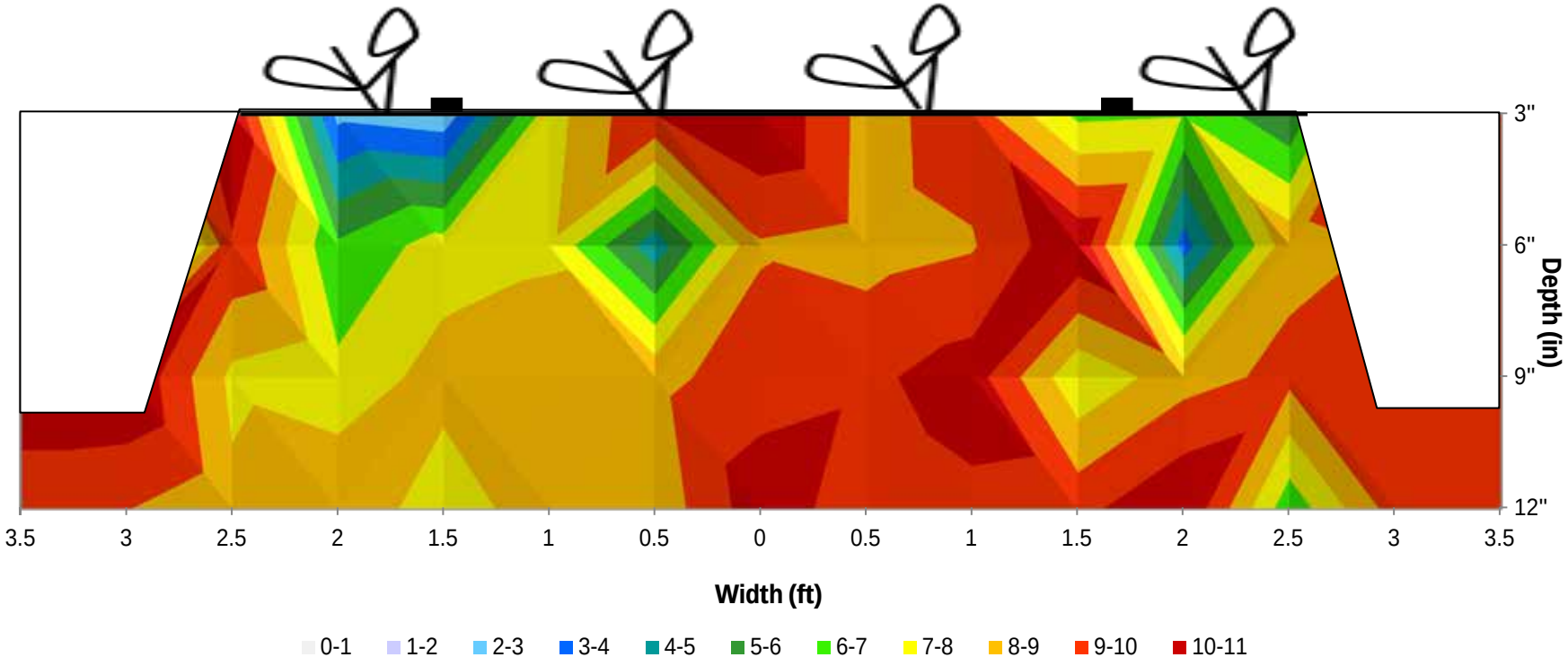
Peikert A Reduced Sprinkler - 2 Tape
EC (dS/m) 3/12/12

Average EC 7.95 dS/m



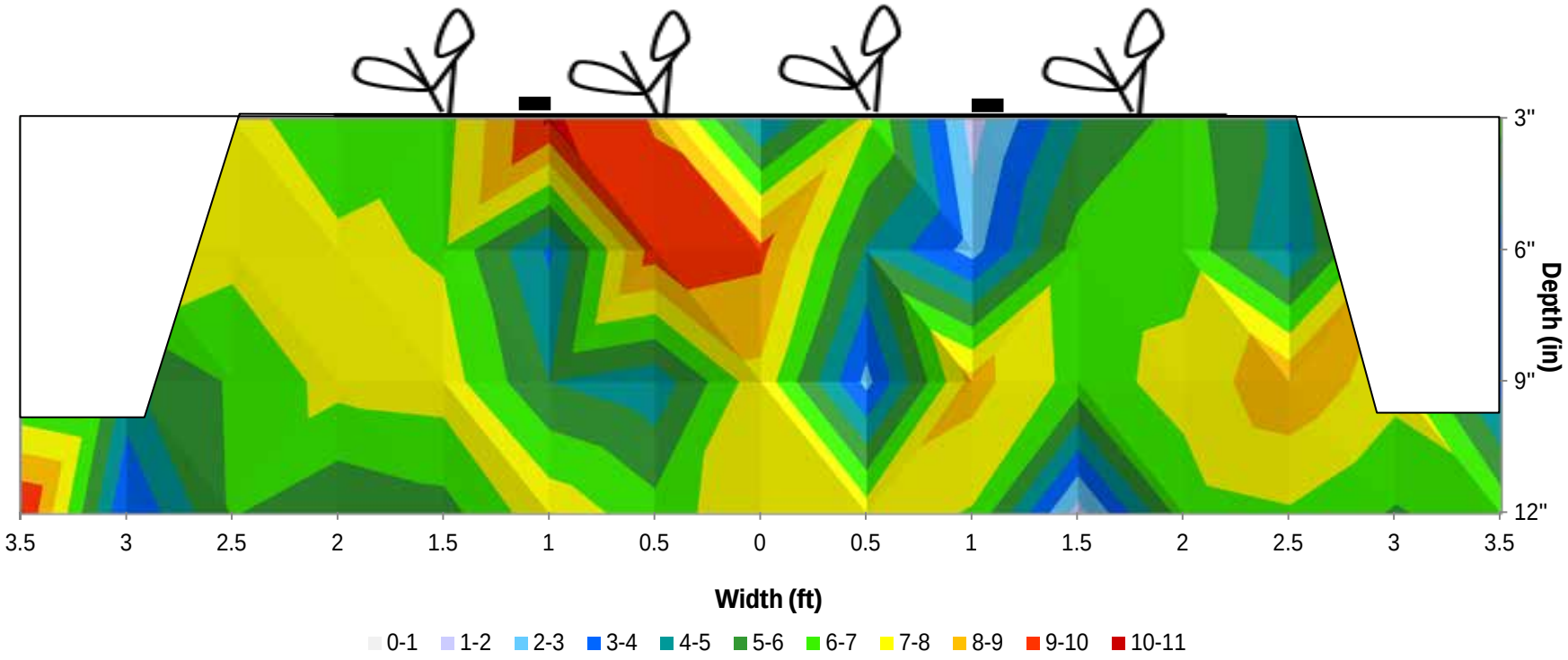
Peikert A Reduced Sprinkler - 2 Tape
EC (dS/m) 5/4/12

Average EC 8.46 dS/m



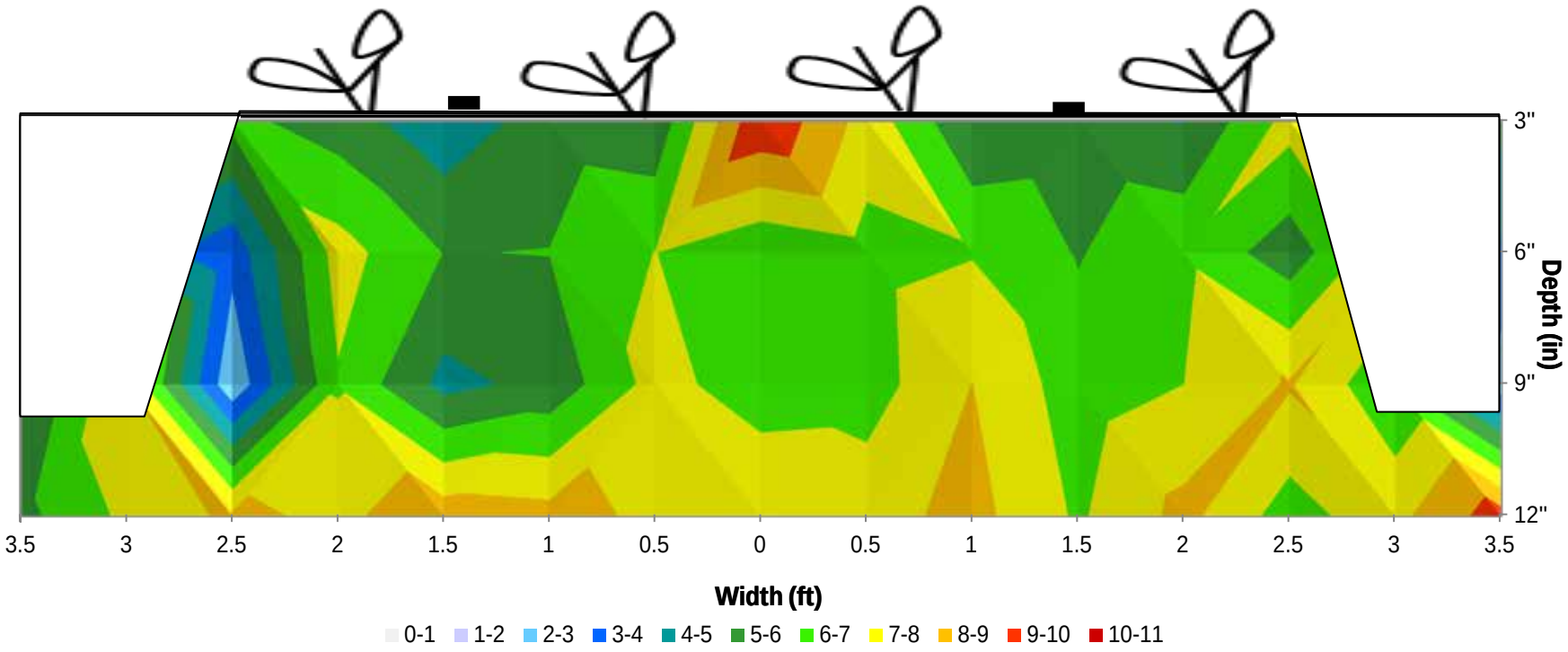
Peikert A Reduced Sprinkler - 2 Tape
EC (dS/m) 6/21/12

Average EC 6.29 dS/m



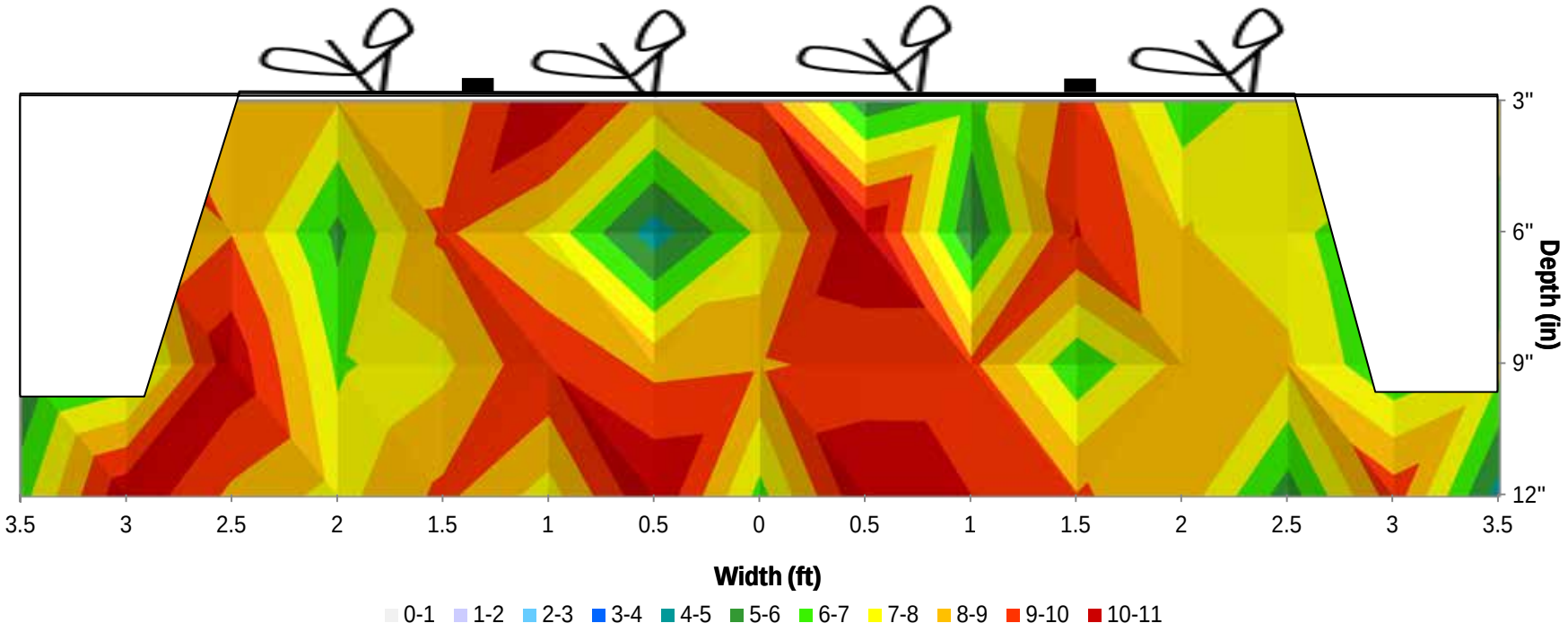
Peikert B Conventional - 2 Tape
EC (dS/m) 3/12/12

Average EC 6.72 dS/m



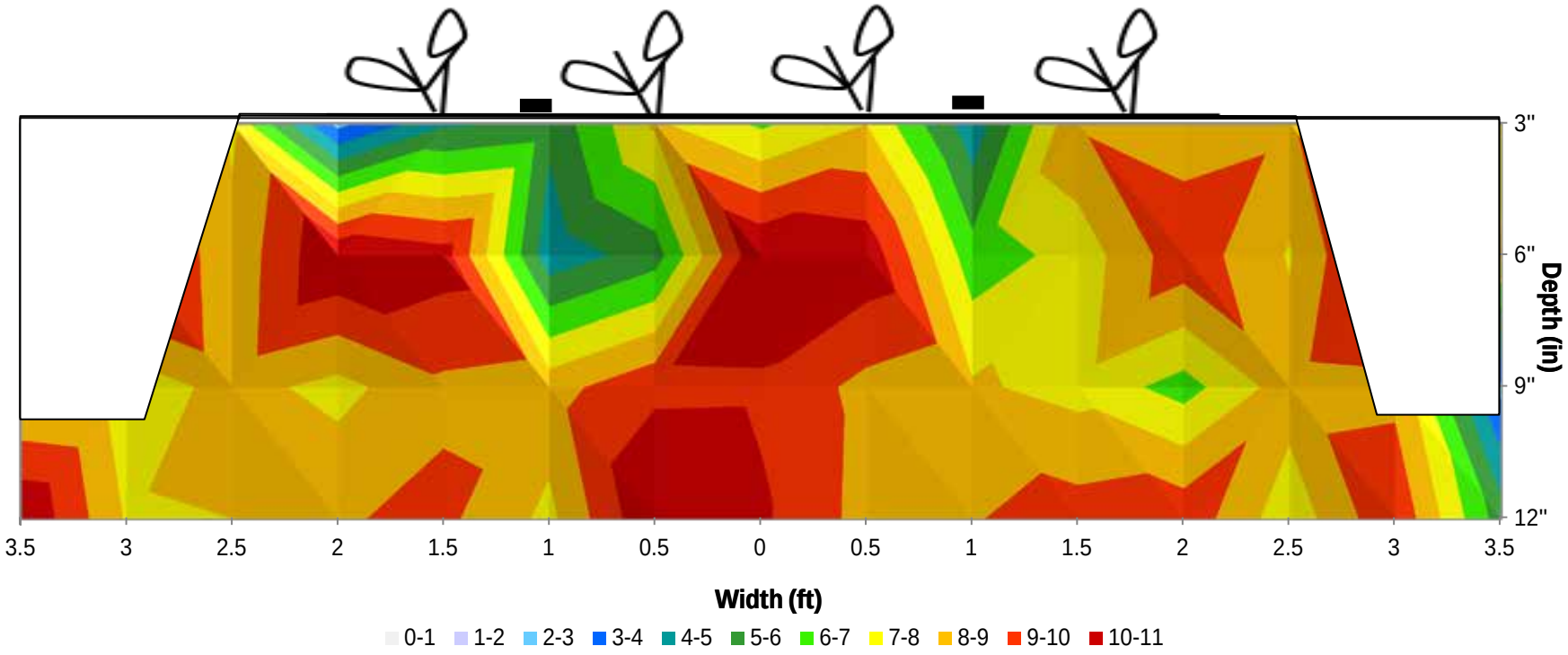
Peikert B Conventional - 2 Tape
EC (dS/m) 5/4/12

Average EC 7.97 dS/m



Peikert B Conventional - 2 Tape
EC (dS/m) 6/21/12

Average EC 8.08 dS/m



Santa Maria Blocks 2011-2012

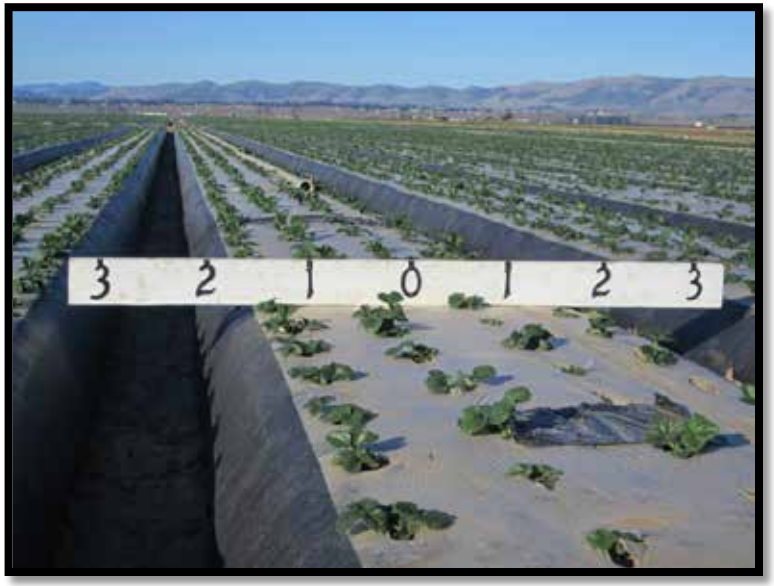
Manzanita

Manzanita - Block 1A

Conventional

1/12/12– 74 DAP

2/8/12– 101 DAP



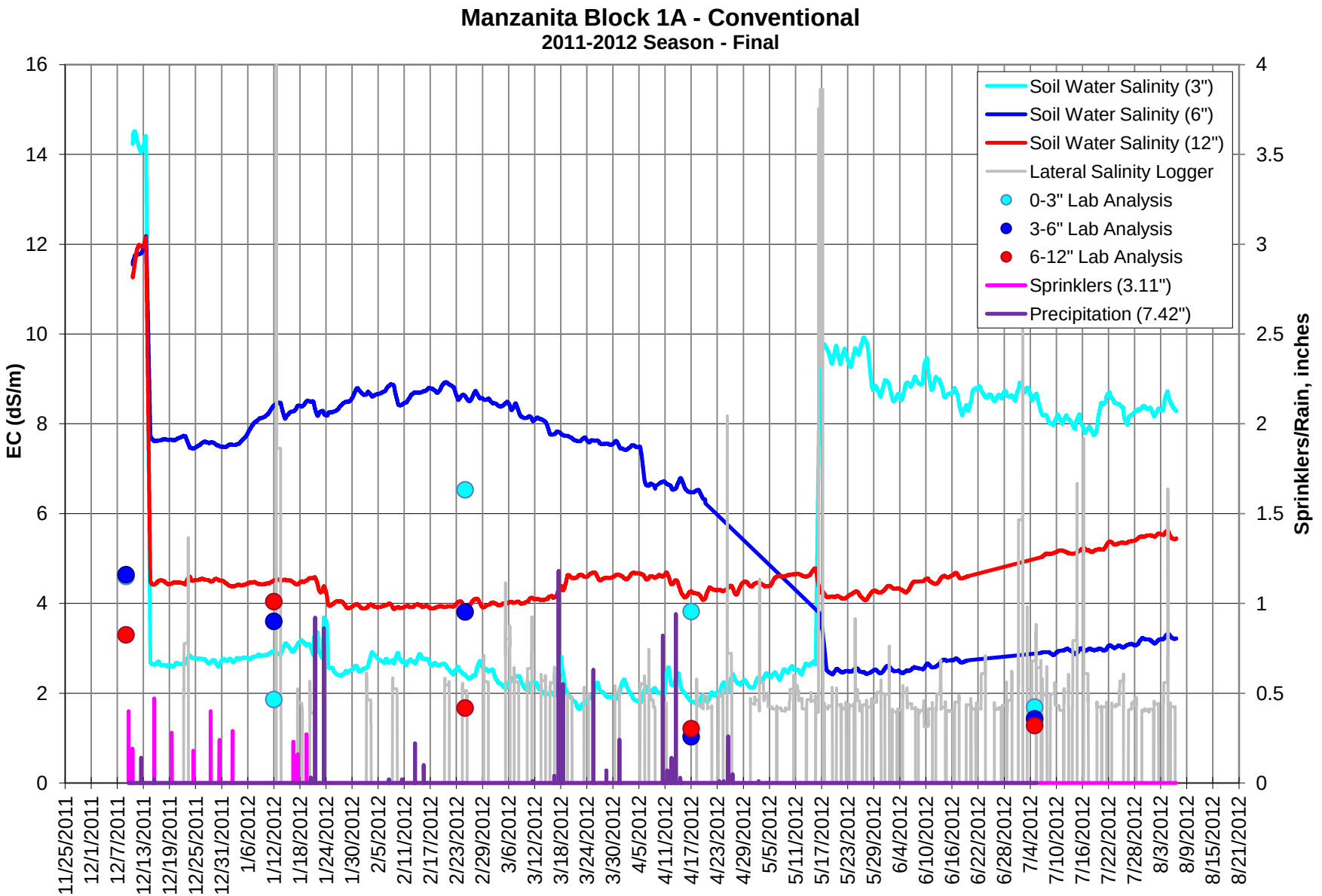
4/6/12– 159 DAP

5/15/12– 198 DAP

Manzanita - Block 1A

Conventional

7/6/12– 250 DAP


Manzanita Block 1A - Conventional
2011-2012 Season - Final
EC (dS/m)
Sprinklers/Rain, inches
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (3.11")
Precipitation (7.42")
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
11/25/2011
12/1/2011
12/7/2011
12/13/2011
12/19/2011
12/25/2011
12/31/2011
1/6/2012
1/12/2012
1/18/2012
1/24/2012
1/30/2012
2/5/2012
2/11/2012
2/17/2012
2/23/2012
2/29/2012
3/6/2012
3/12/2012
3/18/2012
3/24/2012
3/30/2012
4/5/2012
4/11/2012
4/17/2012
4/23/2012
4/29/2012
5/5/2012
5/11/2012
5/17/2012
5/23/2012
5/29/2012
6/4/2012
6/10/2012
6/16/2012
6/22/2012
6/28/2012
7/4/2012
7/10/2012
7/16/2012
7/22/2012
7/28/2012
8/3/2012
8/9/2012
8/15/2012
8/21/2012

Manzanita - Block 1B

Conventional

1/12/12– 74 DAP

2/8/12– 101 DAP

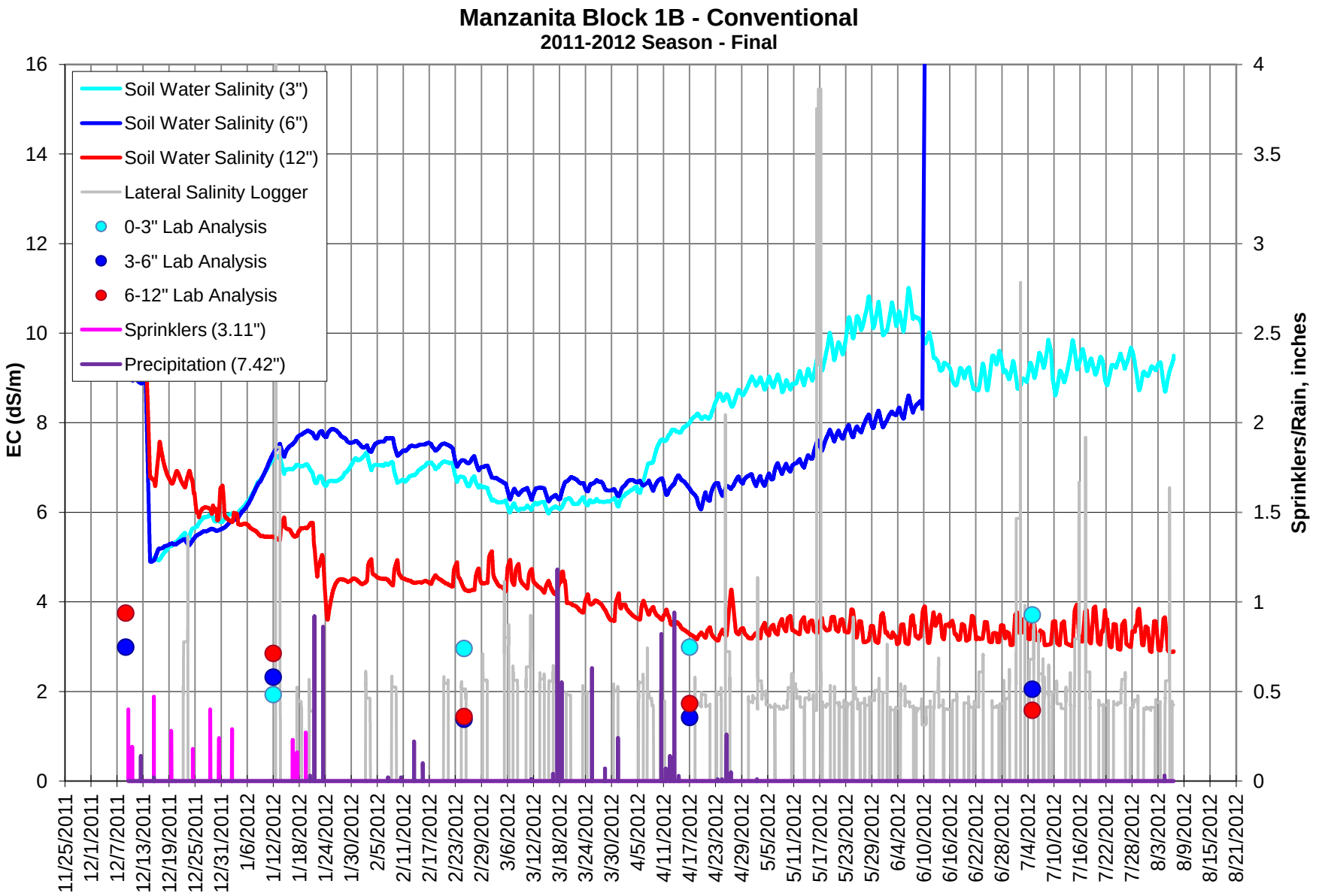
4/6/12– 159 DAP

5/15/12– 198 DAP

Manzanita - Block 1B

Conventional

7/5/12– 249 DAP


Manzanita Block 1B - Conventional
2011-2012 Season - Final
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (3.11")
Precipitation (7.42")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
11/25/2011
12/1/2011
12/7/2011
12/13/2011
12/19/2011
12/25/2011
12/31/2011
1/6/2012
1/12/2012
1/18/2012
1/24/2012
1/30/2012
2/5/2012
2/11/2012
2/17/2012
2/23/2012
2/29/2012
3/6/2012
3/12/2012
3/18/2012
3/24/2012
3/30/2012
4/5/2012
4/11/2012
4/17/2012
4/23/2012
4/29/2012
5/5/2012
5/11/2012
5/17/2012
5/23/2012
5/29/2012
6/4/2012
6/10/2012
6/16/2012
6/22/2012
6/28/2012
7/4/2012
7/10/2012
7/16/2012
7/22/2012
7/28/2012
8/3/2012
8/9/2012
8/15/2012
8/21/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Manzanita 1 Blocks

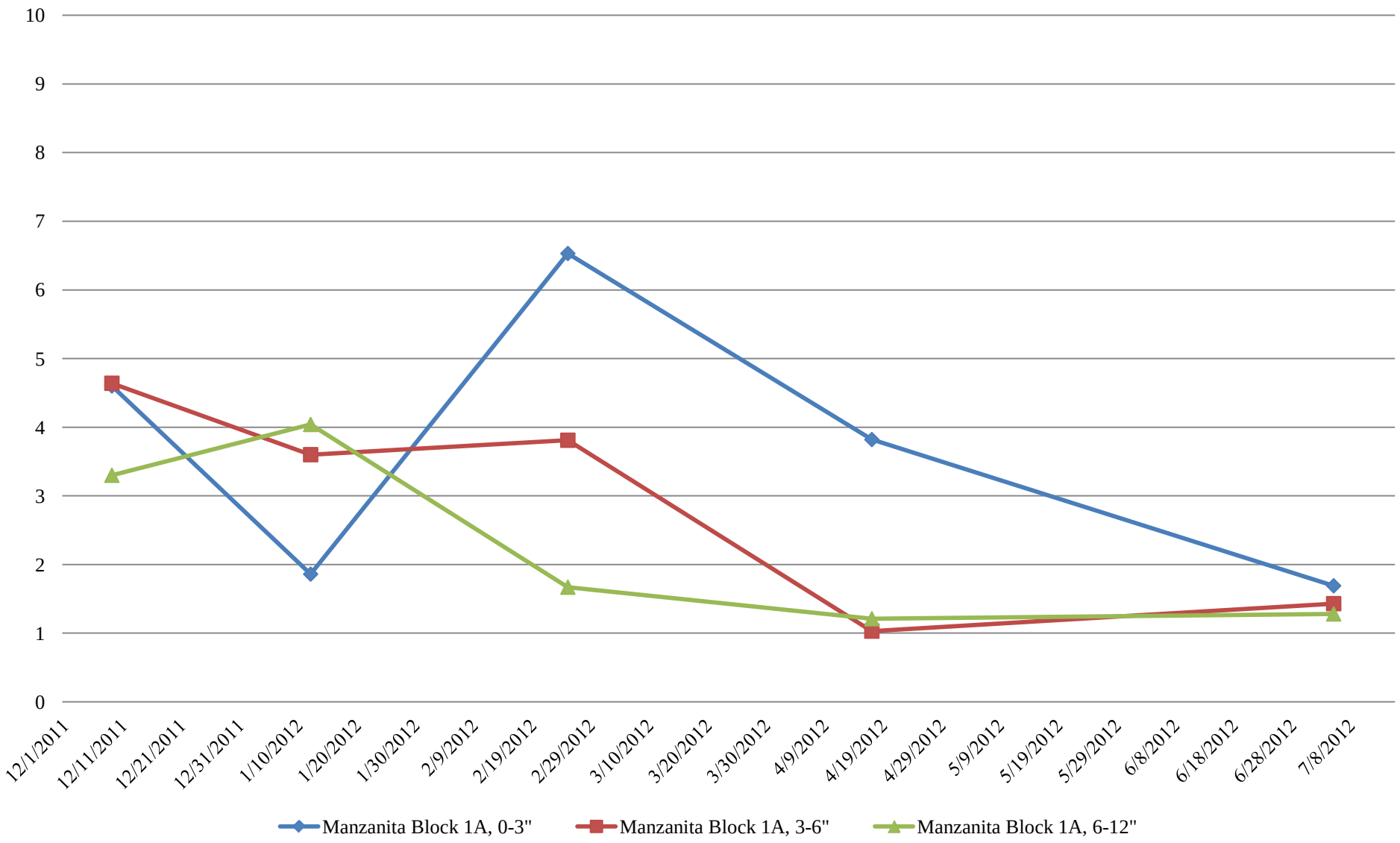
Date:		12/9/2011			1/12/2012			2/25/2012			4/17/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	SSS	4.60	238.35	SSS	1.86	79.10	SSS	6.53	204.75	SSS	3.82	44.80
	3-6"	SSS	4.64	297.50	SSS	3.60	140.00	SSS	3.81	72.45	SSS	1.03	17.85
	6-12"	SSS	3.30	136.50	SSS	4.04	177.45	SSS	1.67	40.25	SSS	1.21	31.15
Block B	0-3"	SSS			SSS	1.93	56.00	SSS	2.96	43.40	SSS	2.99	75.60
	3-6"	SSS	2.99	123.55	SSS	2.32	88.20	SSS	1.38	42.00	SSS	1.42	53.90
	6-12"	SSS	3.75	157.15	SSS	2.85	102.90	SSS	1.44	42.35	SSS	1.73	68.60

Date:		7/5/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	SSS	1.69	45.15
	3-6"	SSS	1.43	45.85
	6-12"	SSS	1.28	34.30
Block B	0-3"	SSS	3.71	113.75
	3-6"	SSS	2.05	72.80
	6-12"	SSS	1.58	47.60

Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

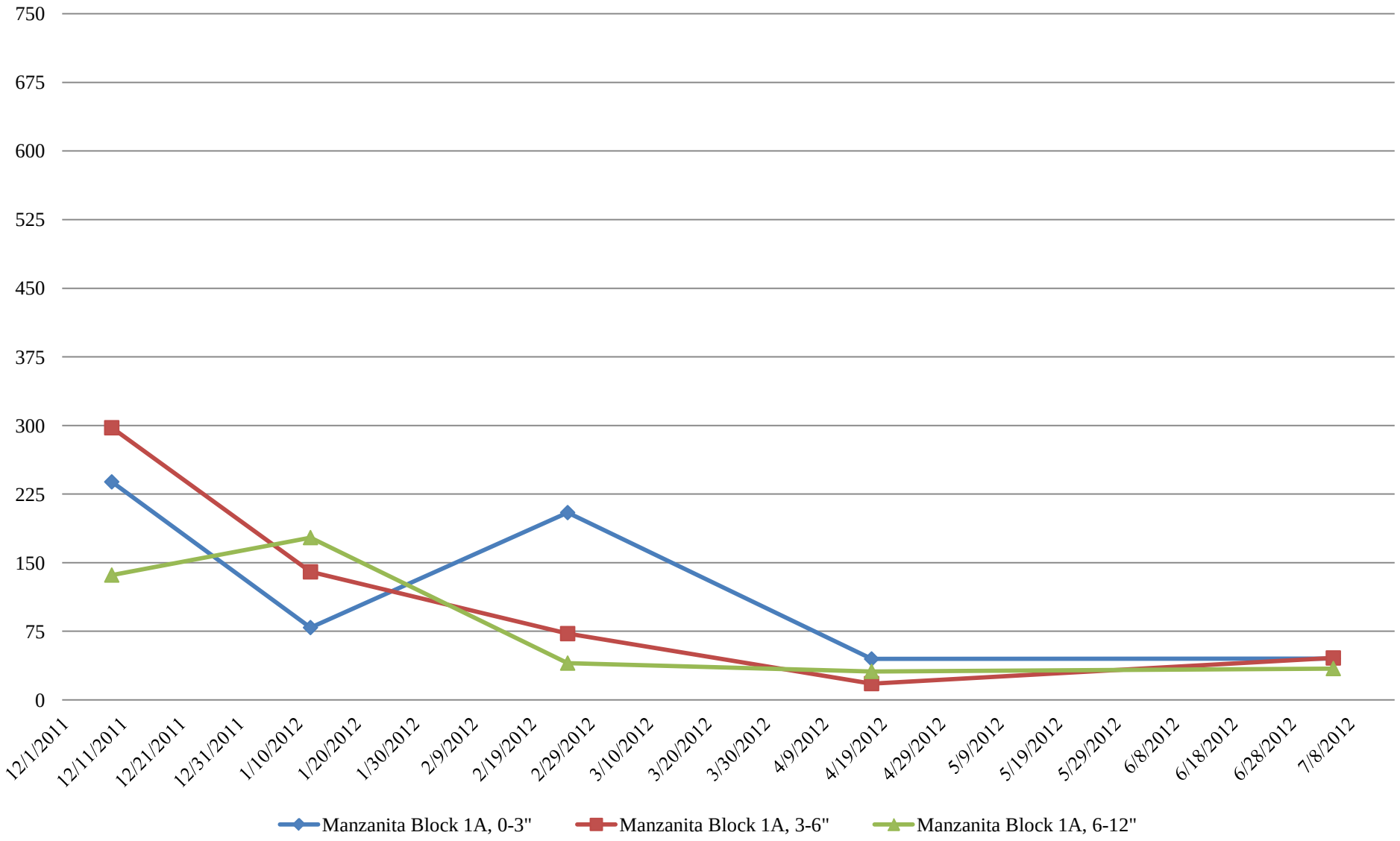
Manzanita Block 1A

Salinity



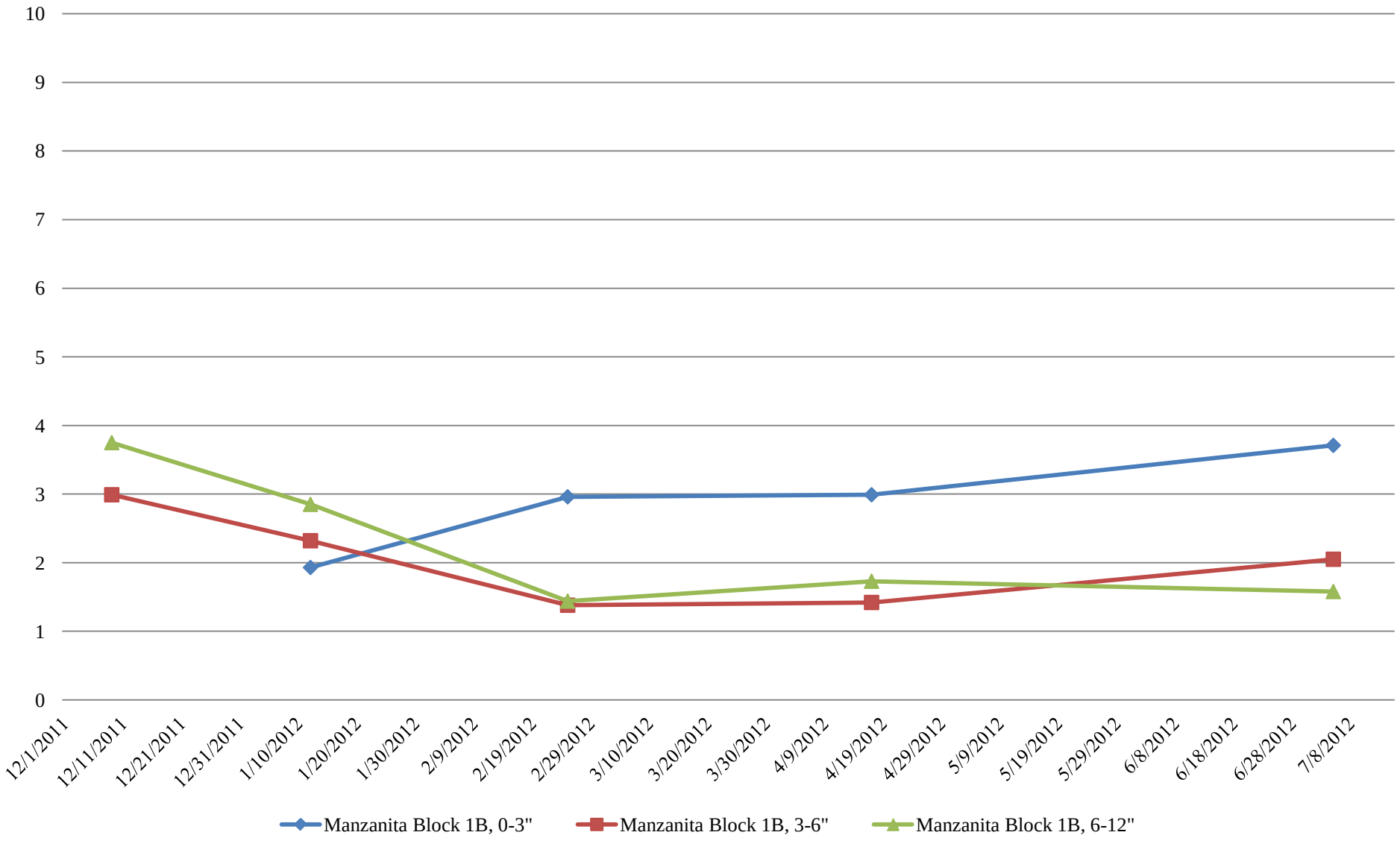
Manzanita Block 1A

Chloride



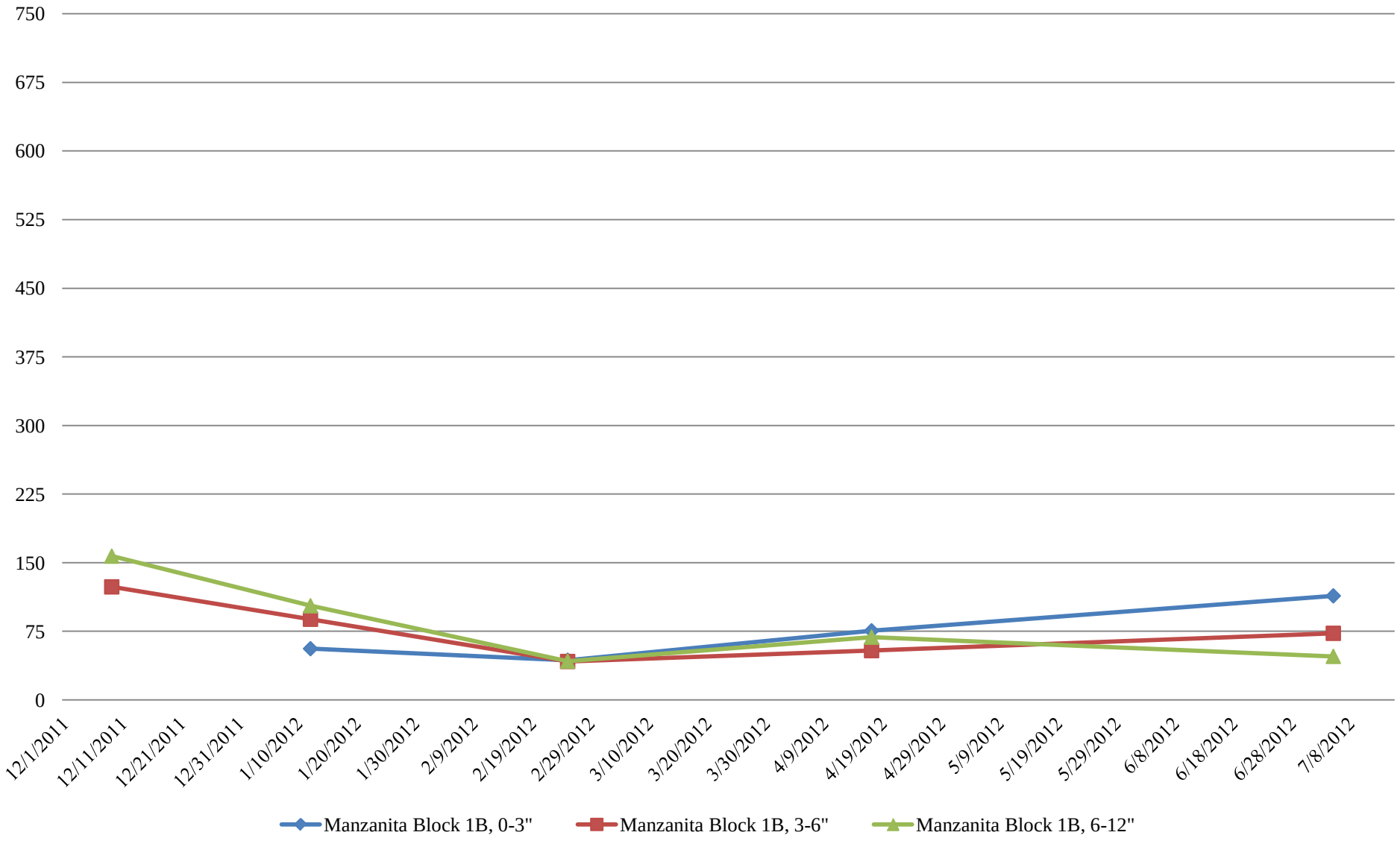
Manzanita Block 1B

Salinity



Manzanita Block 1B

Chloride

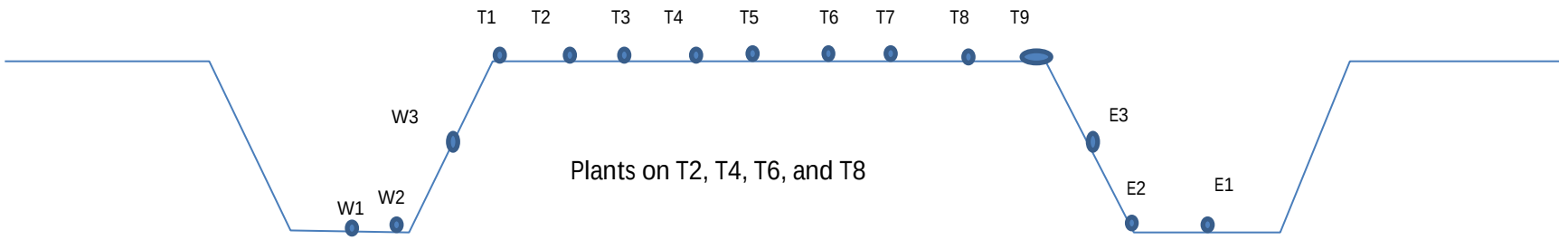


Salinity Data - Top 3 inches

Manzanita Block 1

Using 5TE Sensor and ProCheck

Salinity +8



Block 1A - 12 Jan. 2012

Manzanita	West														East
Blk 1A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	3.18	4.04	4.6	4.57	2.56	5.02	11.8	5.13	7.6	3.93	7.4	6.6	5.4	x
Temp (F)	x	68.7	68.4	66.9	66.6	64.6	64.2	64	64.8	63.3	64	64	64.6	64.6	x
% Moisture	x	21.6	21.1	19.5	20.3	21.4	25.4	19.8	20.3	20.5	19	19.5	21.9	23.1	x

Block 1B - 12 Jan. 2012

Manzanita	West														East
Blk 1B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	6.11	4.16	4.4	5.23	5.38	3.62	4.11	1.12	4	3.81	3.31	7.5	5.52	x
Temp (F)	x	65.8	65.8	65.8	66.4	65.5	65.5	65.7	65.8	65.5	65.7	65.8	65.8	66	x
% Moisture	x	24.7	24.8	21.7	17.9	19.9	19.4	21.6	22	21.9	20.1	21.4	22	22.2	x

Block 1A - 8 Feb. 2012

Manzanita	West														East
Blk 1A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	5.27	5.77	4.61	6.39	4.91	4.09	4.12	7.93	4.85	5.74	2.38	5.69	6.03	7.78	x
Temp (F)	77	75.7	76.1	80.1	80.6	78.4	75.4	72.7	72.1	70.5	69.8	69.8	70.3	70	x
% Moisture	13.9	26.3	18.4	17.9	16.5	29.5	22.5	16.3	19.4	19.2	18.3	19	23.3	26.5	x

Block 1B - 8 Feb. 2012

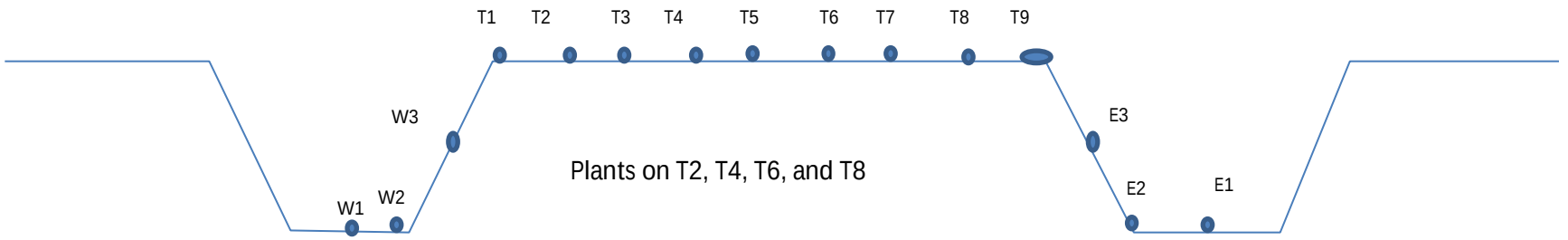
Manzanita	West														East
Blk 1B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	3.77	6.73	5.19	5.39	5.01	5.01	5.87	2.9	3.39	2.46	4.98	3.46	5.85	x
Temp (F)	x	73.4	75.4	77.7	77.4	75.4	73.6	72.5	72	71.2	70.7	71.2	71.2	71.1	x
% Moisture	x	26	17.4	17	22.7	29.7	19.3	15.5	23.1	17	13.4	12.3	21.3	24.3	x

Salinity Data - Top 3 inches

Manzanita Block 1

Using 5TE Sensor and ProCheck

Salinity +8



Block 1A - 6 April 2012

Manzanita	West														East
Blk 1A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	5.68	6.07	5.06	6.77	5.69	5.46	17.78	5.78	6.55	5.97	6.2	3.91	8.45	x
Temp (F)	x	66.7	65.5	64.2	63.5	63.3	63.1	63.5	64.8	64.8	64.8	64.2	64	64.8	x
% Moisture	x	20.5	19.8	15.7	17.4	20.3	20	19.6	19.1	23.8	21.3	16	23.9	23.2	x

Block 1B - 6 April 2012

Manzanita	West														East
Blk 1B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	3.93	4.7	6.53	1.93	4.43	4.26	8.56	5.77	3.82	5.63	4.72	6.89	4.8	x
Temp (F)	x	60.8	60.6	60.3	59.5	59.7	60.4	60.3	59.9	59.7	59.4	59.2	59.2	60.6	x
% Moisture	x	22.3	19.2	16.4	18.1	21.7	20.4	17.8	18.1	21	20.7	19.9	22.9	26.4	x

Block 1A - 15 May 2012

Manzanita	West														East
Blk 1A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	5.28	2.55	1.75	2.66	4.58	5.63	8.78	4.12	4.2	7.29	4.18	3.12	5.37	x
Temp (F)	x	74.1	75.6	77.5	77.5	76.1	75.2	74.7	72.9	72.9	74	75.4	76.1	76.1	x
% Moisture	x	25.5	24	18.8	22	22.6	22.3	26	23.6	22.6	23.4	22.3	27.3	24.1	x

Block 1B - 15 May 2012

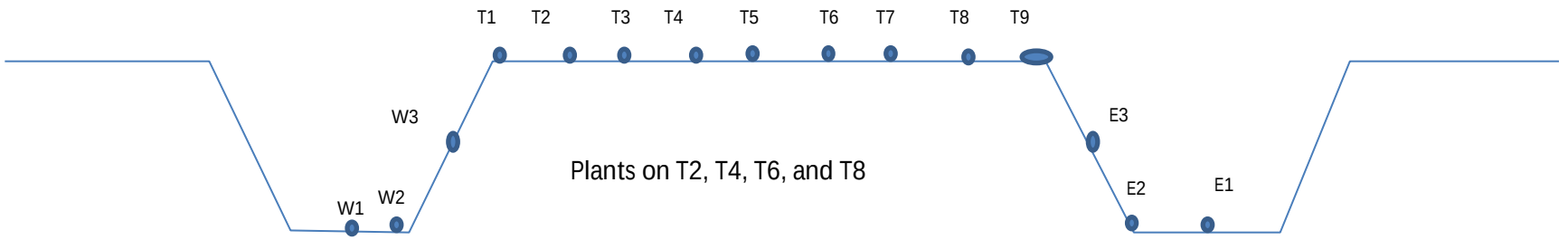
Manzanita	West														East
Blk 1B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	2.84	2.96	4.38	3.9	3.86	4.8	6.11	6.24	4.61	5.51	5.69	5.41	4.88	x
Temp (F)	x	75.6	79	80.2	80.4	78.8	77.7	77	76.3	76.6	77	77	77.2	77.4	x
% Moisture	x	24.4	19	20.8	22.5	23	21.6	21.8	20.8	21	19.9	18.8	19.3	20.4	x

Salinity Data - Top 3 inches

Manzanita Block 1

Using 5TE Sensor and ProCheck

Salinity +8



Block 1A - 5 July 2012

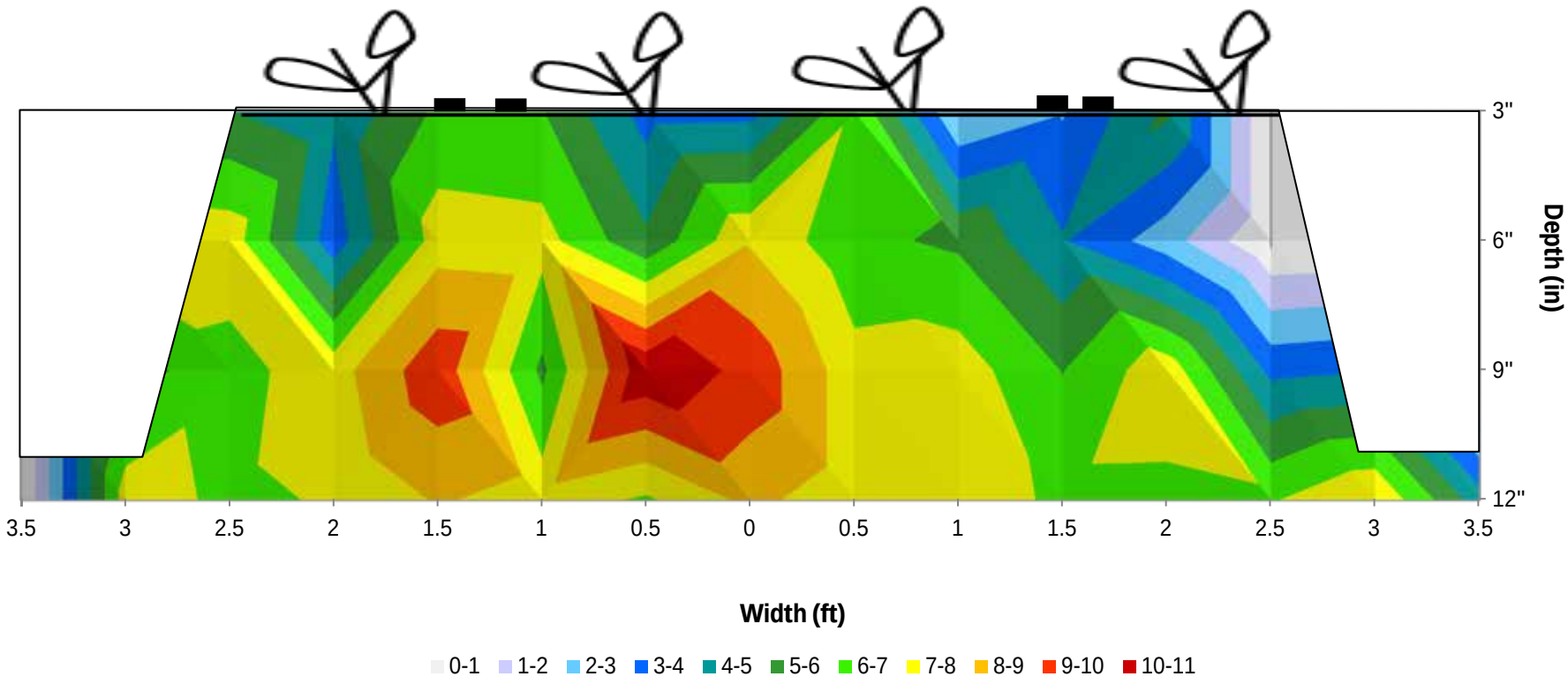
Manzanita	West													East
Blk 1A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	2.11	2.88	4.46	0.62	2.71	9.08	12.47	6.46	4.99	8.83	8.04	4.74	5.17	X
Temp (F)	X	65.8	66.6	66.9	67.1	67.3	67.6	68.2	68	67.8	67.6	67.8	68	68	X
% Moisture	X	20.7	22.9	23.5	21.1	22.3	26.9	27.8	24.2	23.6	18.2	24.3	24	29.1	X

Block 1B - 5 July 2012

Manzanita	West													East
Blk 1B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	7.38	5.73	4.16	7.46	3.16	0.94	8.51	0.91	5.18	4.02	5.03	7.06	7.42	X
Temp (F)	X	66.4	67.5	67.6	67.8	67.8	67.8	68	67.6	67.6	67.5	67.3	67.5	67.8	X
% Moisture	X	23.2	21.6	19.9	21.4	23.1	24	24.9	21.9	23.2	22.9	19	21.8	22.2	X

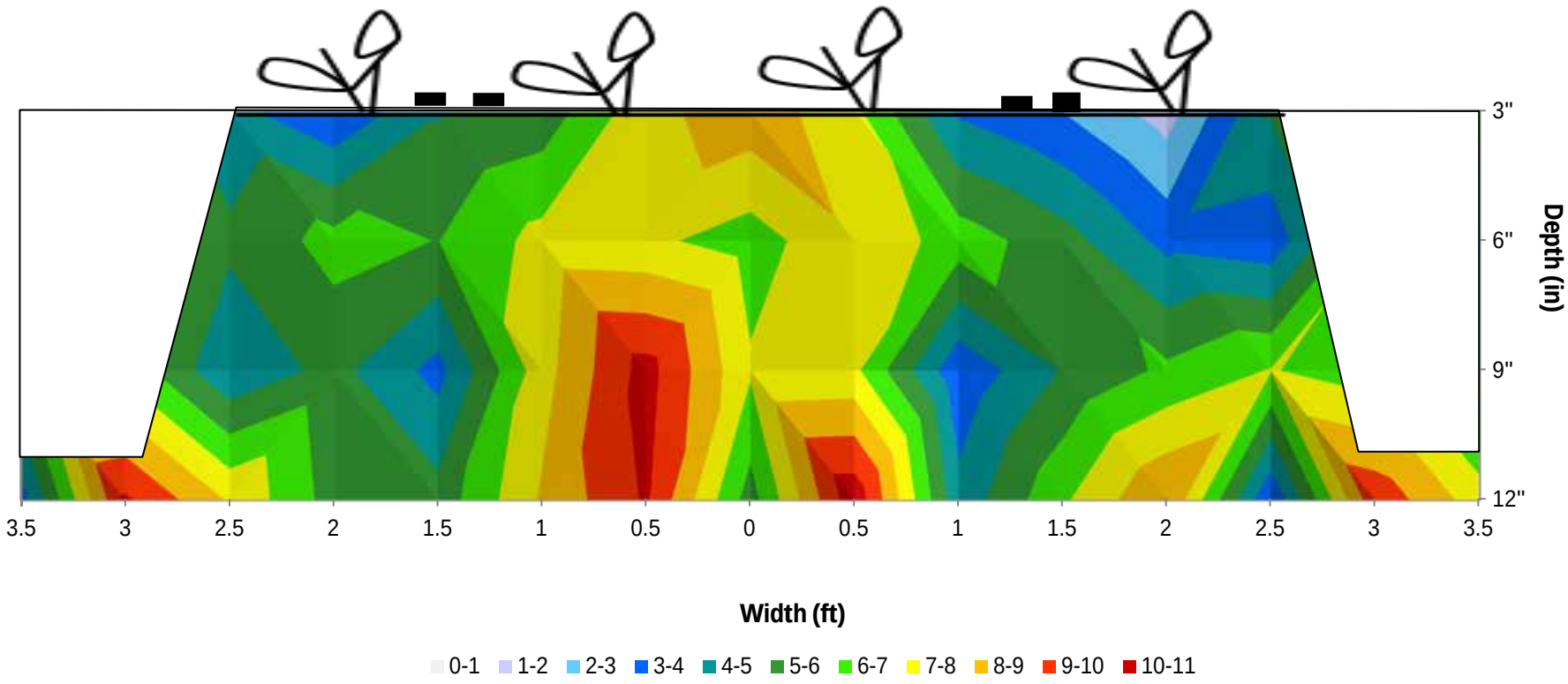
Manzanita Block 1 A Reduced Sprinkler - 2 Tape
EC (dS/m) 1/6/12

Average EC 6.27 dS/m



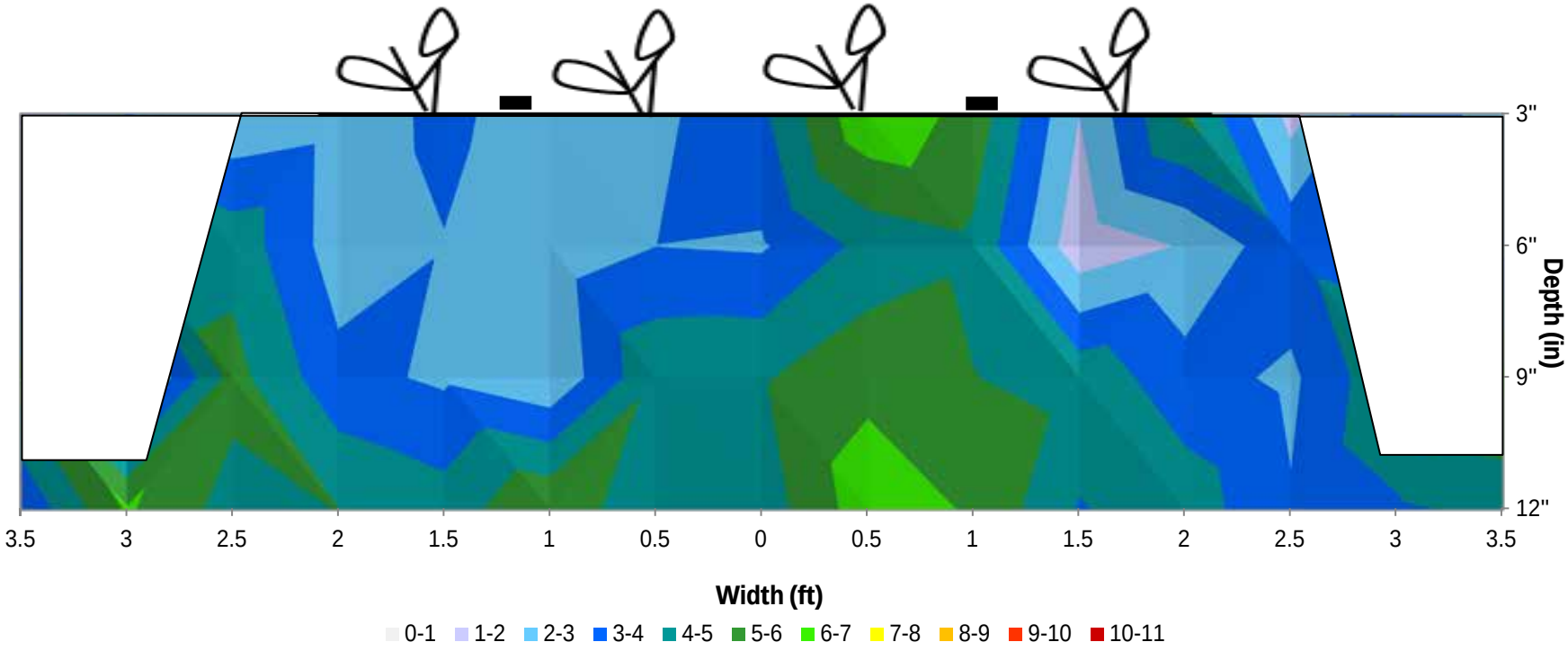
Manzanita Block 1 A Reduced Sprinkler - 4 Tape
EC (dS/m) 2/25/12

Average EC 6.08 dS/m



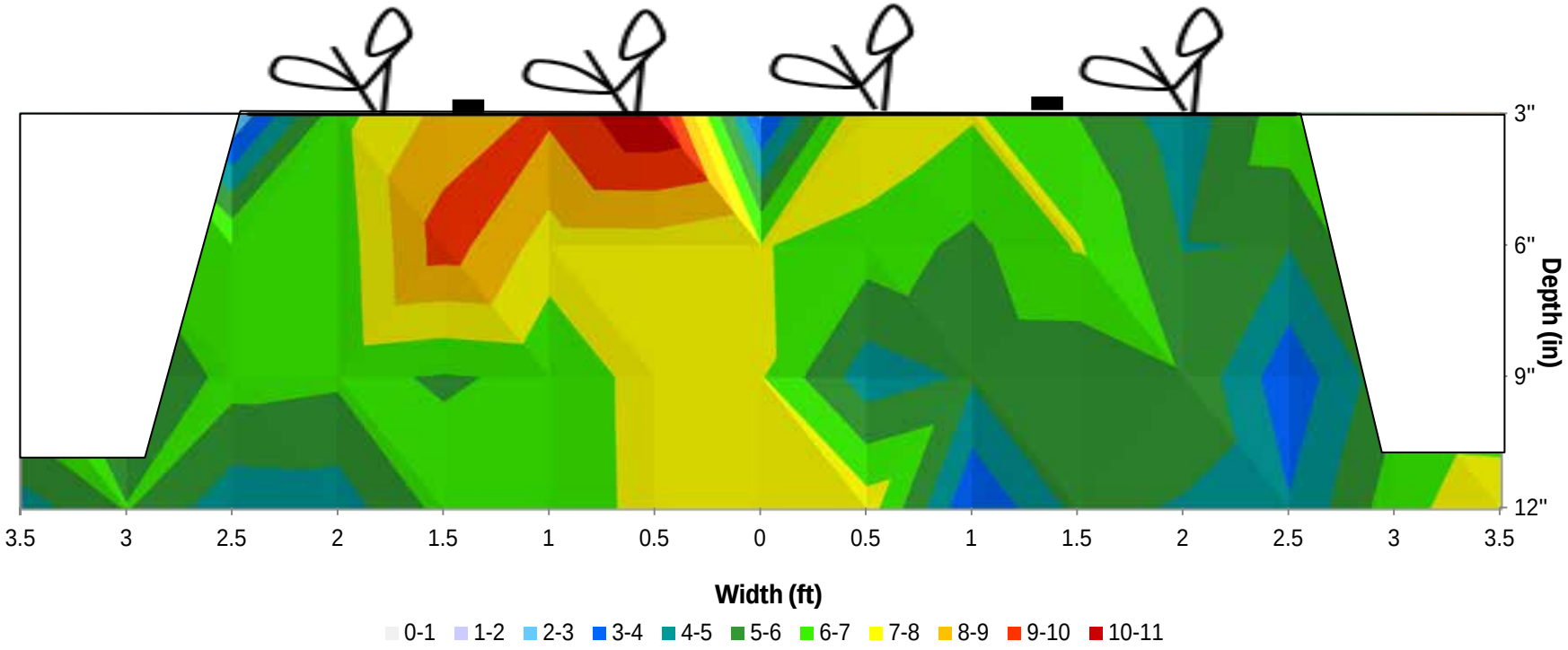
Manzanita Block 1A Reduced Sprinkler - 2 Tape
EC (dS/m) 4/17/12

Average EC 3.81 dS/m



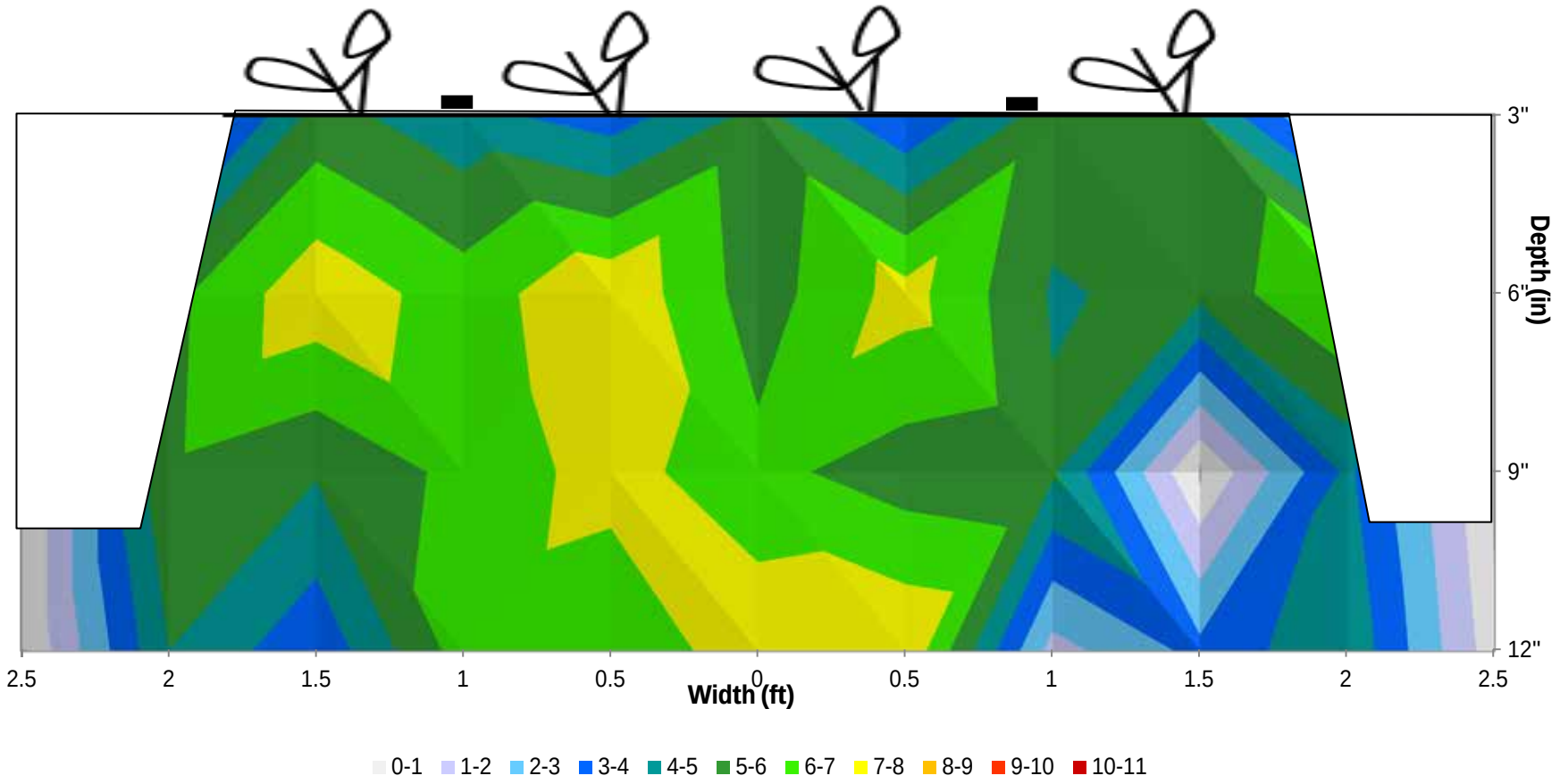
Manzanita Block 1 A Reduced Sprinkler - 2 Tape
EC (dS/m) 5/7/12

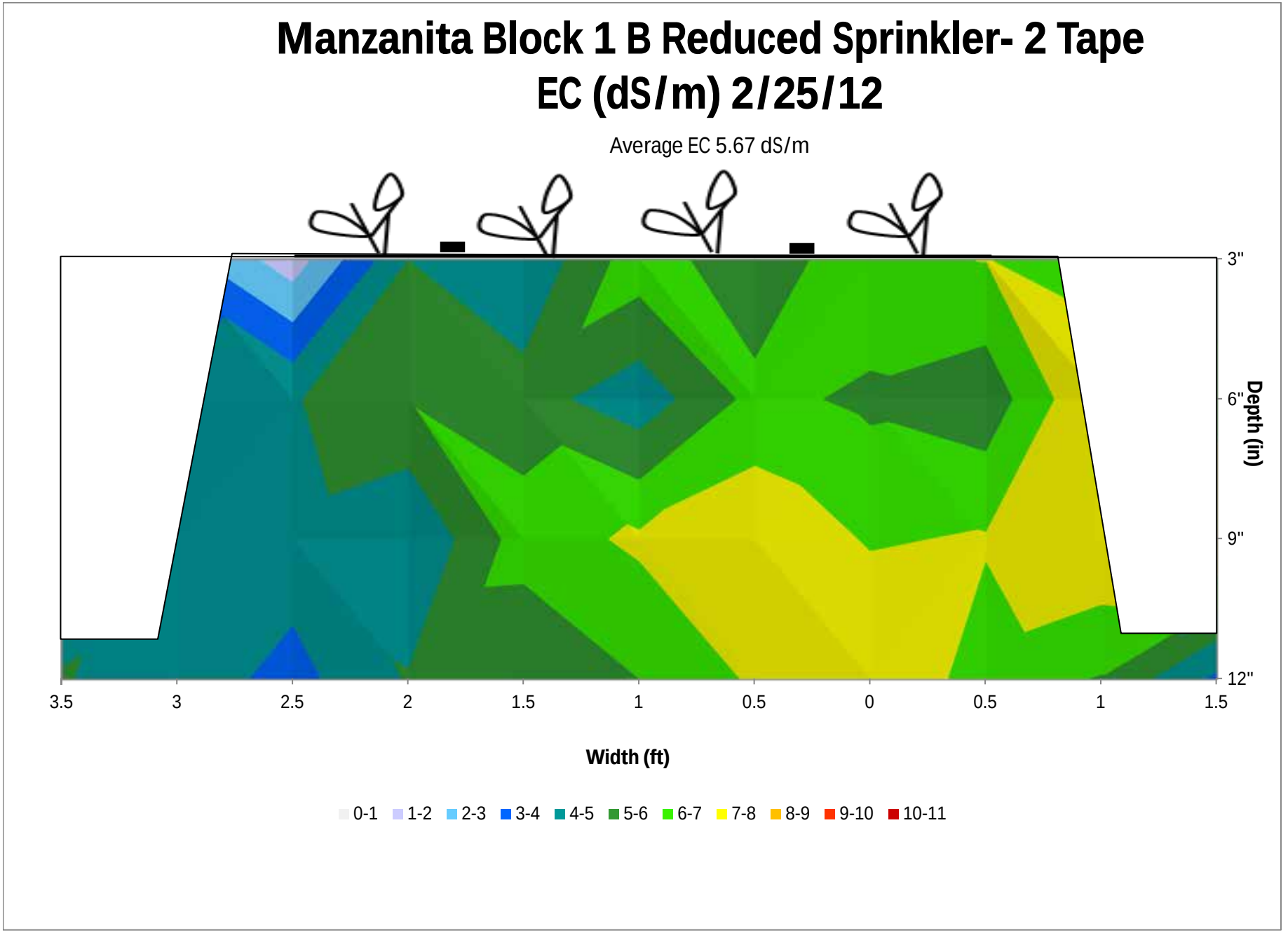
Average EC 6.17 dS/m



Manzanita Block 1 B Reduced Sprinkler - 2 Tape
EC (dS/m) 1/6/12

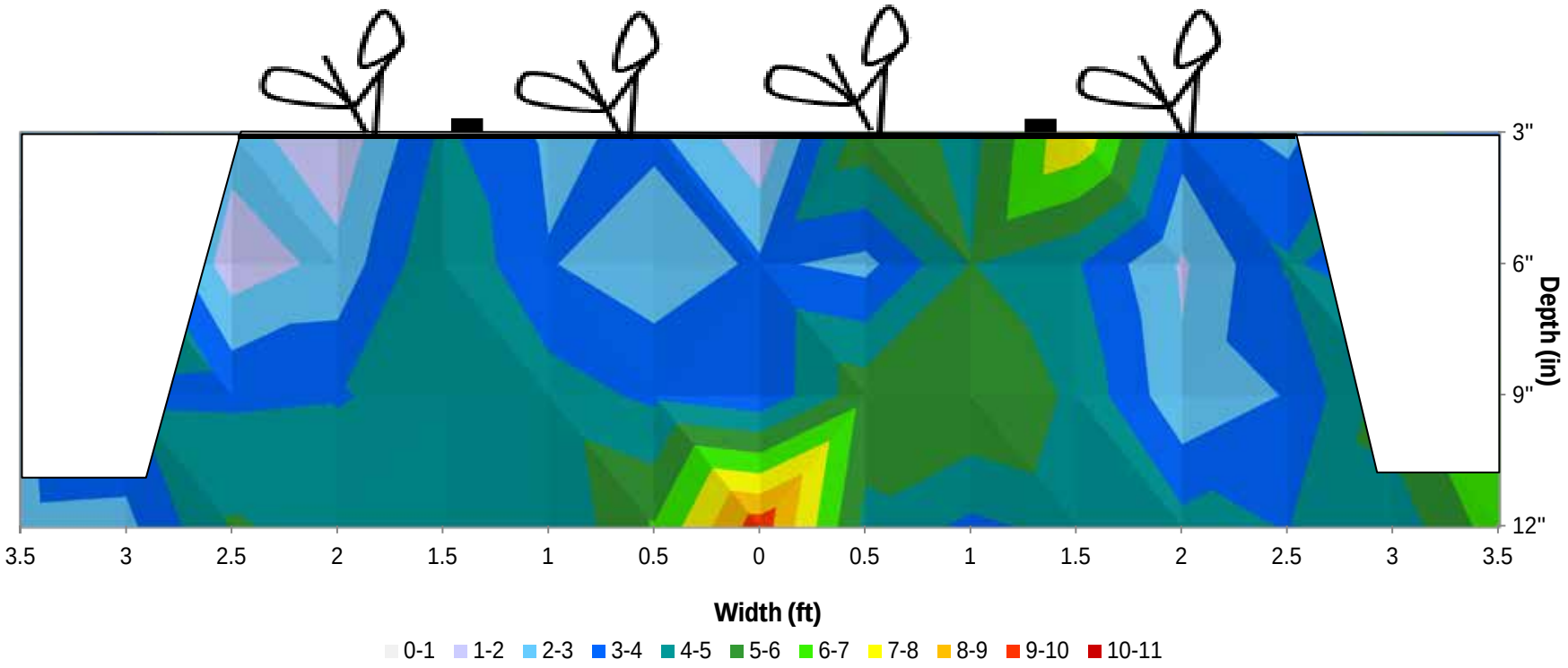
Average EC 5.0 dS/m




Manzanita Block 1 B Reduced Sprinkler- 2 Tape
EC (dS/m) 2/25/12
Average EC 5.67 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11

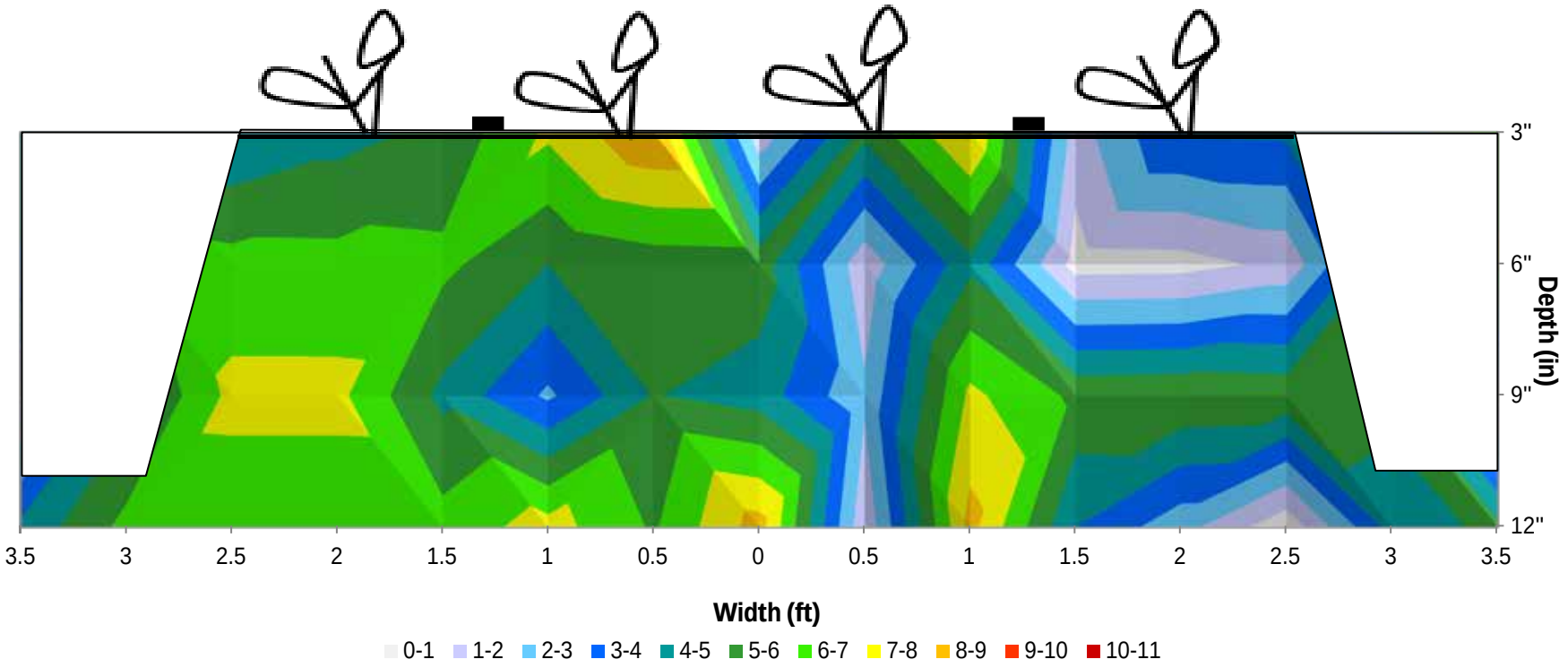
Manzanita Block 1A Reduced Sprinkler - 2 Tape
EC (dS/m) 4/17/12

Average EC 3.99 dS/m



Manzanita Block 1 B Reduced Sprinkler - 2 Tape
EC (dS/m) 5/7/12

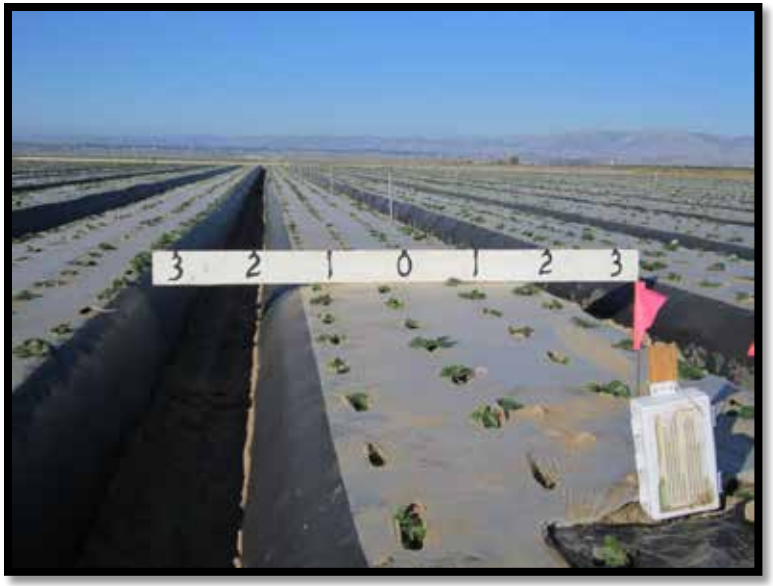
Average EC 4.77 dS/m



Manzanita - Block 2A

Reduced Sprinkler

1/12/12– 74 DAP



2/8/12– 101 DAP

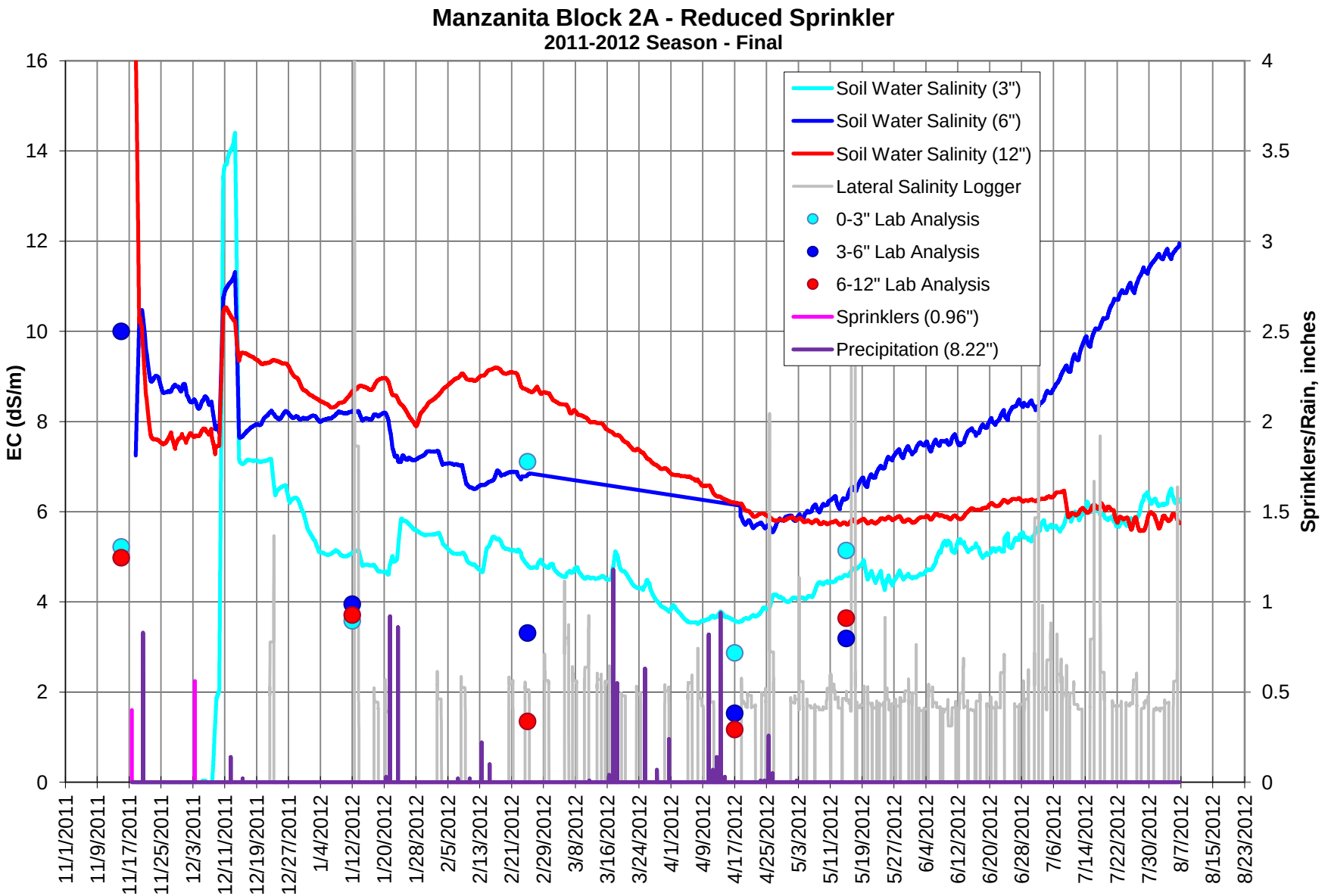
4/6/12– 159 DAP

5/15/12– 198 DAP

Manzanita - Block 2A

Reduced Sprinkler

7/5/12– 249 DAP


Manzanita Block 2A - Reduced Sprinkler
2011-2012 Season - Final
EC (dS/m)
Sprinklers/Rain, inches
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (0.96")
Precipitation (8.22")
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
11/1/2011
11/9/2011
11/17/2011
11/25/2011
12/3/2011
12/11/2011
12/19/2011
12/27/2011
1/4/2012
1/12/2012
1/20/2012
1/28/2012
2/5/2012
2/13/2012
2/21/2012
2/29/2012
3/8/2012
3/16/2012
3/24/2012
4/1/2012
4/9/2012
4/17/2012
4/25/2012
5/3/2012
5/11/2012
5/19/2012
5/27/2012
6/4/2012
6/12/2012
6/20/2012
6/28/2012
7/6/2012
7/14/2012
7/22/2012
7/30/2012
8/7/2012
8/15/2012
8/23/2012

Manzanita - Block 2B

Conventional

1/12/12– 74 DAP

2/8/12– 101 DAP

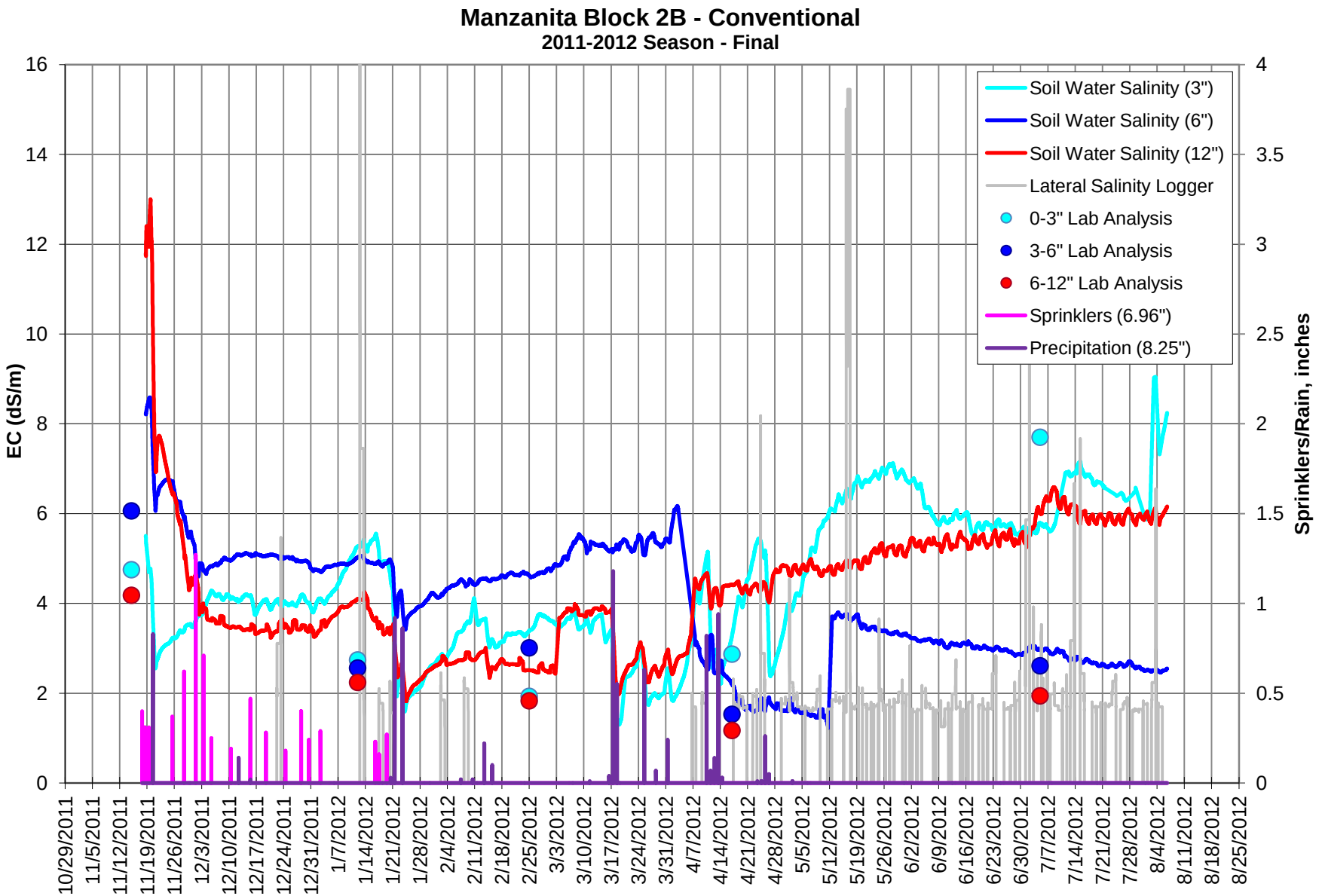
4/6/12– 159 DAP

5/15/12– 198 DAP

Manzanita - Block 2B

Conventional

7/5/12– 249 DAP


Manzanita Block 2B - Conventional
2011-2012 Season - Final
EC (dS/m)
Sprinklers/Rain, inches
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (6.96")
Precipitation (8.25")
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
10/29/2011
11/5/2011
11/12/2011
11/19/2011
11/26/2011
12/3/2011
12/10/2011
12/17/2011
12/24/2011
12/31/2011
1/7/2012
1/14/2012
1/21/2012
1/28/2012
2/4/2012
2/11/2012
2/18/2012
2/25/2012
3/3/2012
3/10/2012
3/17/2012
3/24/2012
3/31/2012
4/7/2012
4/14/2012
4/21/2012
4/28/2012
5/5/2012
5/12/2012
5/19/2012
5/26/2012
6/2/2012
6/9/2012
6/16/2012
6/23/2012
6/30/2012
7/7/2012
7/14/2012
7/21/2012
7/28/2012
8/4/2012
8/11/2012
8/18/2012
8/25/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Manzanita 2 Blocks

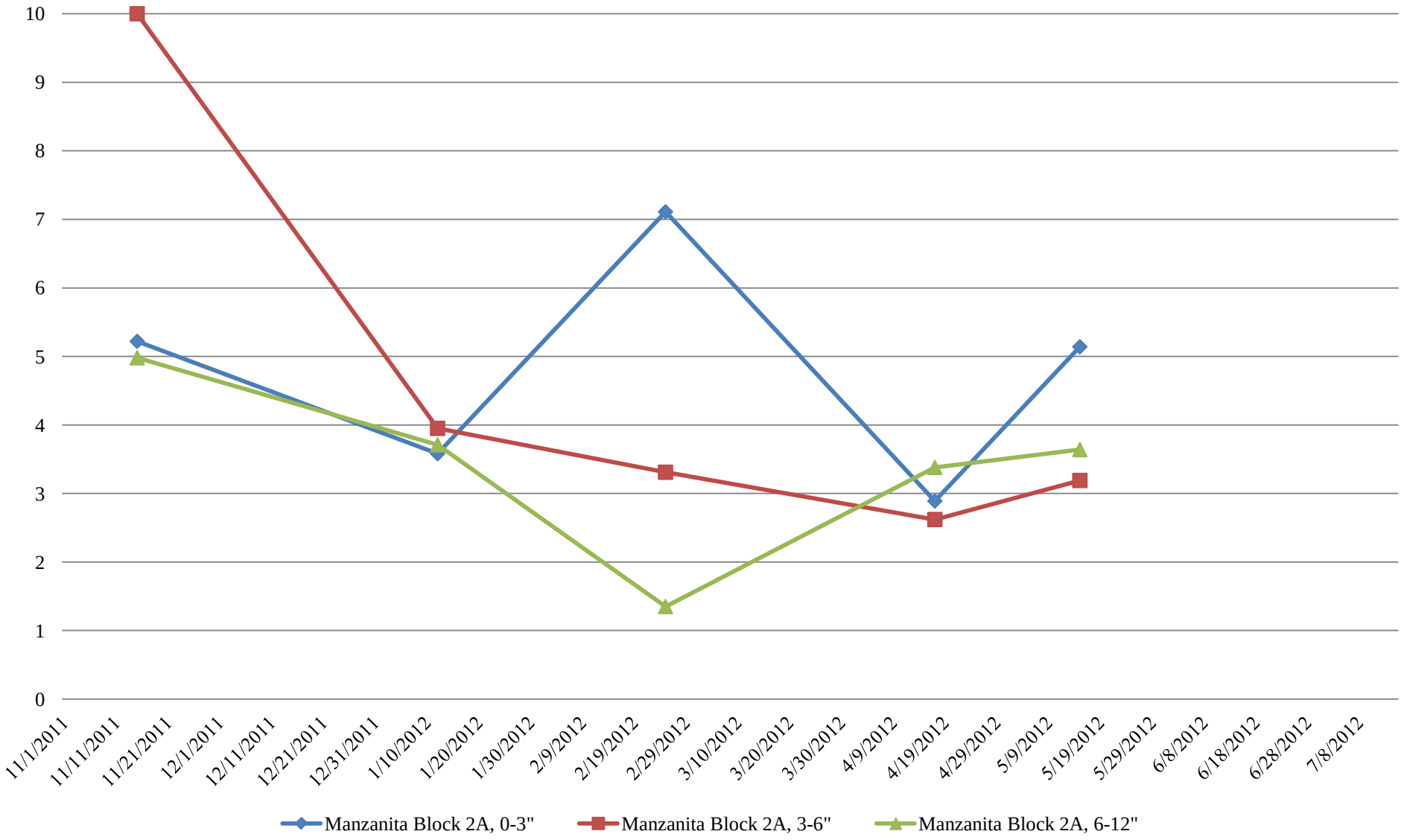
Date:		11/15/2011			1/12/2012			2/25/2012			4/17/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	5.22	371.00	DLS	3.58	136.50	DLS	7.11	147.00	DLS	2.89	76.65
	3-6"	DLS	10.00	204.75	DLS	3.95	140.70	DLS	3.31	46.20	DLS	2.62	51.80
	6-12"	DLS	4.98	201.25	DLS	3.71	147.00	DLS	1.35	35.35	DLS	3.38	142.80
Block B	0-3"	SSS	4.75	318.50	SSS	2.74	80.50	SSS	1.93	97.65	SSS	2.87	158.90
	3-6"	SSS	6.06	150.15	SSS	2.56	92.40	SSS	3.01	169.75	SSS	1.53	63.35
	6-12"	SSS	4.18	122.85	SSS	2.24	70.00	SSS	1.83	62.65	SSS	1.17	36.40

Date:		5/15/2012			7/5/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	5.14	406.00	DLS		
	3-6"	DLS	3.19	158.55	DLS		
	6-12"	DLS	3.64	185.50	DLS		
Block B	0-3"	SSS			SSS	7.70	889.00
	3-6"	SSS			SSS	2.61	132.30
	6-12"	SSS			SSS	1.94	63.35

Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

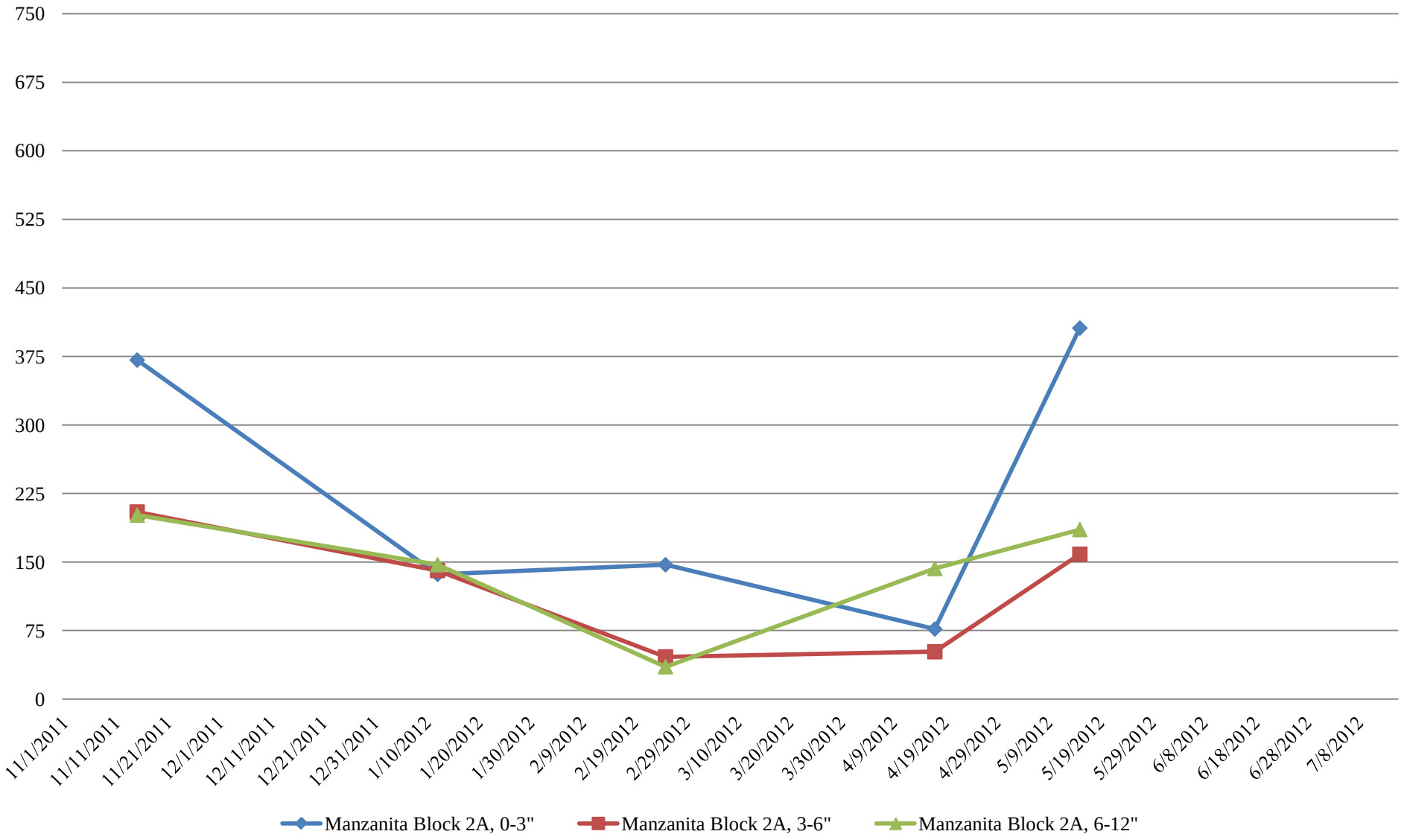
Manzanita Block 2A

Salinity



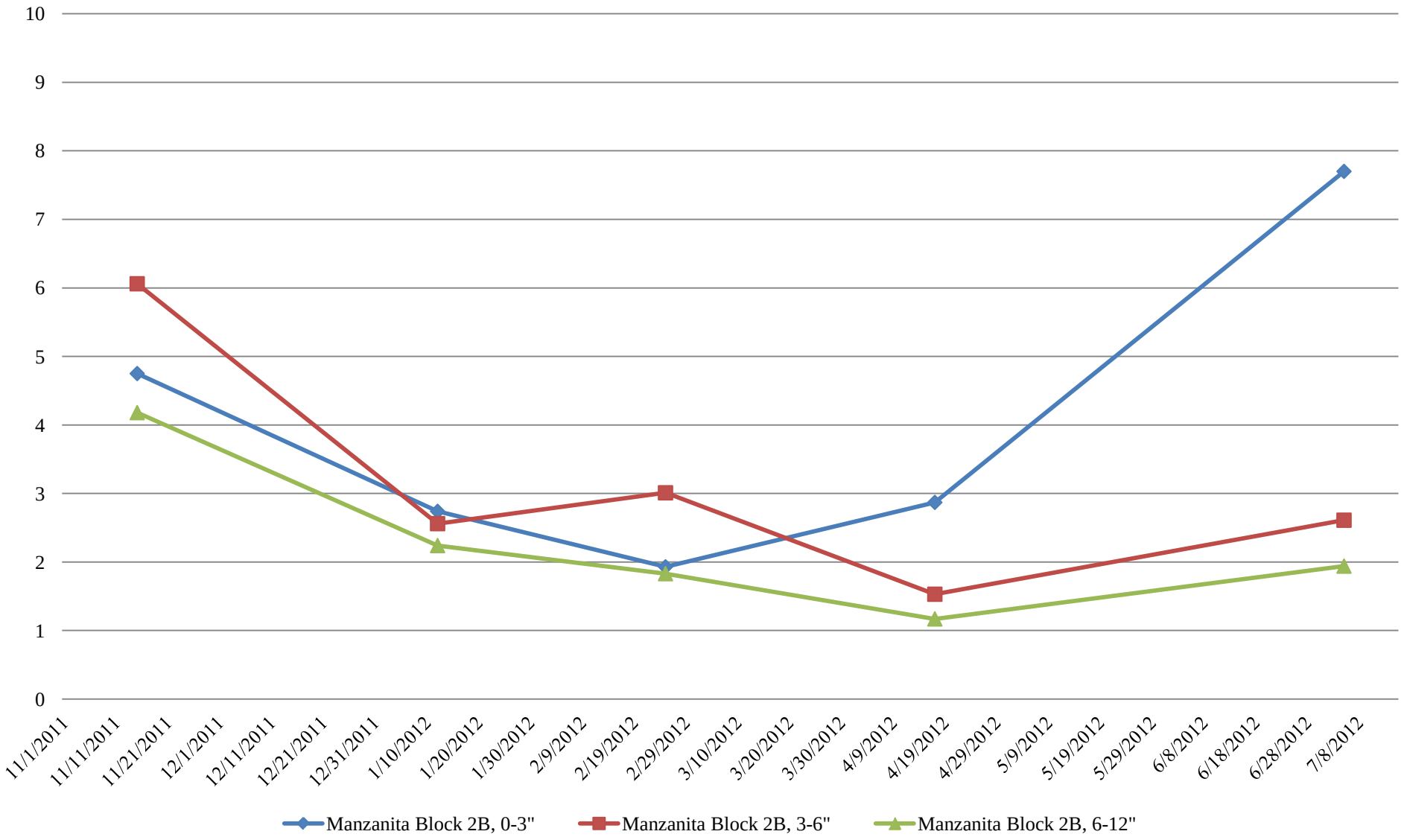
Manzanita Block 2A

Chloride



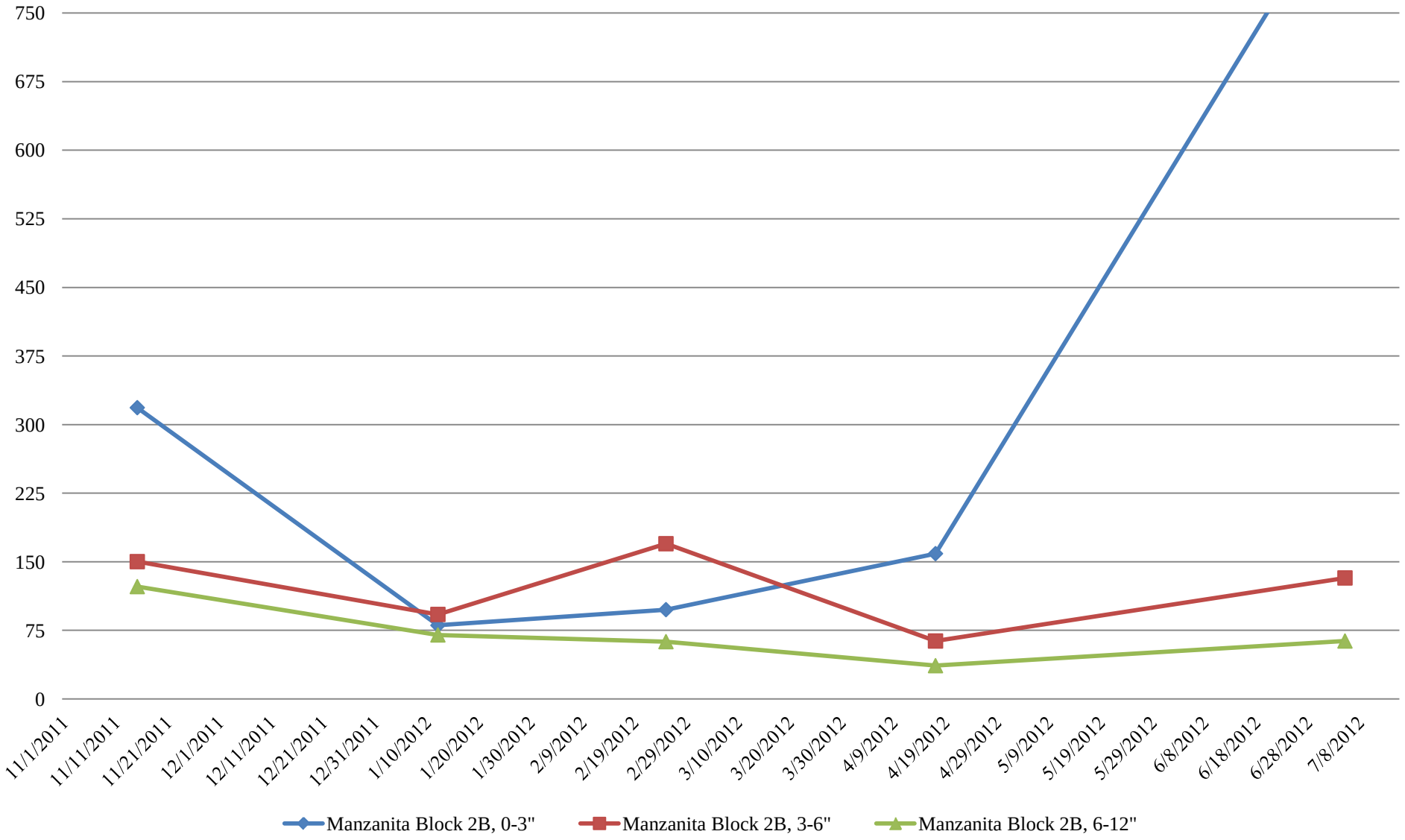
Manzanita Block 2B

Salinity



Manzanita Block 2B

Chloride

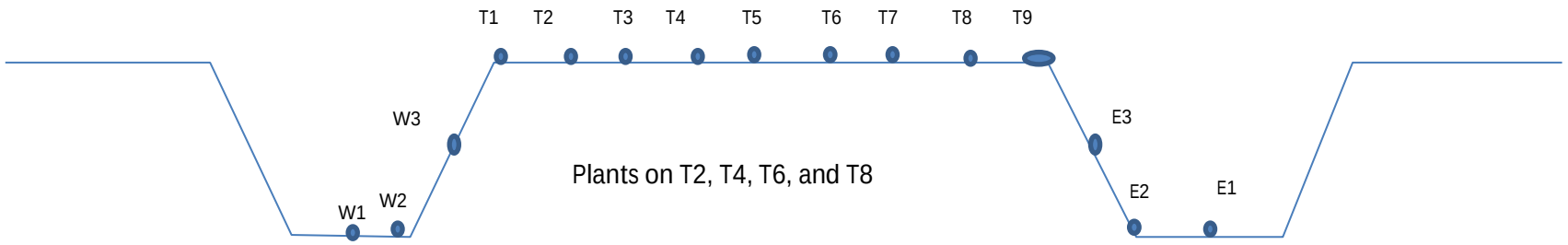


Salinity Data - Top 3 inches

Manzanita Block 2

Using 5TE Sensor and ProCheck

Salinity +8



Block 2A - 12 Jan. 2012

Manzanita	West													East
Blk 2A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	11.2	6.02	6.07	1.76	1.36	5.6	9.5	4.6	4.45	3.46	2.75	6.83	10.58	x
Temp (F)	x	64.8	64.9	64.8	65.3	65.8	66.2	66	65.5	65.3	65.1	64.9	64.8	64.2	x
% Moisture	x	22.2	22.4	20.3	18.8	18.9	24.8	20.6	22.9	22.6	21.3	19.1	22.6	25.8	x

Block 2B - 12 Jan. 2012

Manzanita	West													East
Blk 2B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	3.88	6.64	3.9	6.45	6.04	4.26	8.23	1.76	5.71	3.09	3.77	6.06	6.88	x
Temp (F)	x	67.3	67.5	68.9	69.6	68.4	67.3	66.6	66.4	65.7	65.7	65.5	65.3	64.6	x
% Moisture	x	24.8	19.9	18	16.8	19.4	24.4	19.2	16.9	18.9	18.2	18.6	20	18.5	x

Block 2A - 19 Jan. 2012

Manzanita	West													East
Blk 2A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	9.59	10.64	7.33	5.59	5.01	3.05	9.57	6.86	5.63	8.46	6.34	6.86	2.79	x
Temp (F)	x	58.1	56.1	56.5	57	57.7	58.8	59.2	59.7	58.6	57.9	58.3	58.3	59	x
% Moisture	x	23.5	24.2	21.8	20.4	22.5	19.9	21.2	23.3	18.7	17.4	21.3	21.7	23.9	x

Block 2B - 19 Jan. 2012

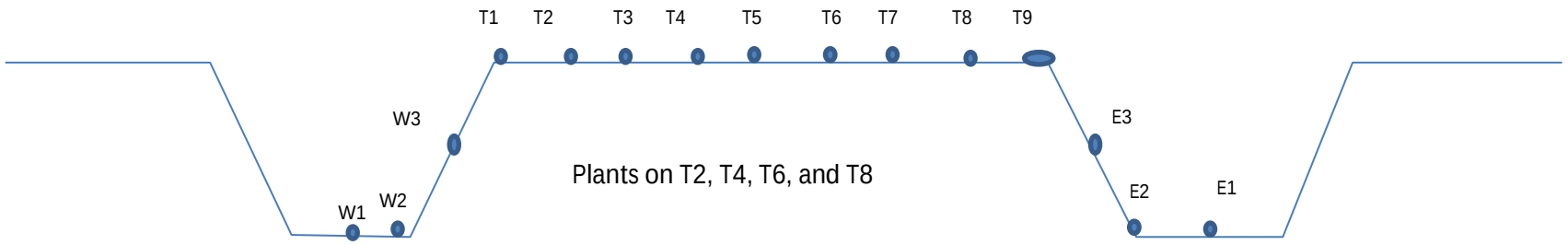
Manzanita	West													East
Blk 2B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	6.22	5.65	5.1	4.62	5.83	1.55	5.5	4.58	4.73	5.7	5.81	6.04	7.5	x
Temp (F)	x	54.5	54	54.1	54.9	55.4	56.3	57	57.7	57.7	57.9	57.4	55.8	57.6	x
% Moisture	x	25.1	23.8	20.8	24.1	18.9	22.3	19	23.9	15.8	24.8	19.6	25.6	22.5	x

Salinity Data - Top 3 inches

Manzanita Block 2

Using 5TE Sensor and ProCheck

Salinity +8



Block 2A - 8 Feb. 2012

Manzanita	West														East
Blk 2A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	1.69	7.1	5.45	5.41	2.04	3.94	4.35	7.47	5.51	4.8	2.93	4.18	5.7	6.91	x
Temp (F)	80.4	79.9	79.7	78.6	78.1	76.1	73.6	71.8	70.3	69.9	69.4	68.9	68.4	67.5	x
% Moisture	13.5	21.2	22.4	18.6	15.5	31.7	20	16.2	19.5	15.7	17	12.3	18.9	29.3	x

Block 2B - 8 Feb. 2012

Manzanita	West														East
Blk 2B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	5.54	5.21	4.44	0.43	4.35	6.13	4.45	4.53	5.01	4.99	5.03	3.97	4.49	x
Temp (F)	x	75.9	78.8	80.1	79.9	77.5	76.6	75.9	75.7	74.8	74.1	73.9	73.8	73.2	x
% Moisture	x	24	14.2	13.2	13.9	11.2	11	12.8	17.4	16	14.1	11.1	18.5	22.7	x

Block 2A - 6 April 2012

Manzanita	West														East
Blk 2A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	3.5	3.7	3.42	1.05	2.81	4.53	7.3	3.5	2.82	4.34	5.3	3.23	6.68	x
Temp (F)	x	71.6	70.2	68.2	66.4	65.8	66.4	66.7	65.7	65.7	66	67.6	70.3	71.2	x
% Moisture	x	25.3	24.2	21	17.9	22.4	23.6	21.5	20.8	18.9	21.9	18.8	18.8	25.6	x

Block 2B - 6 April 2012

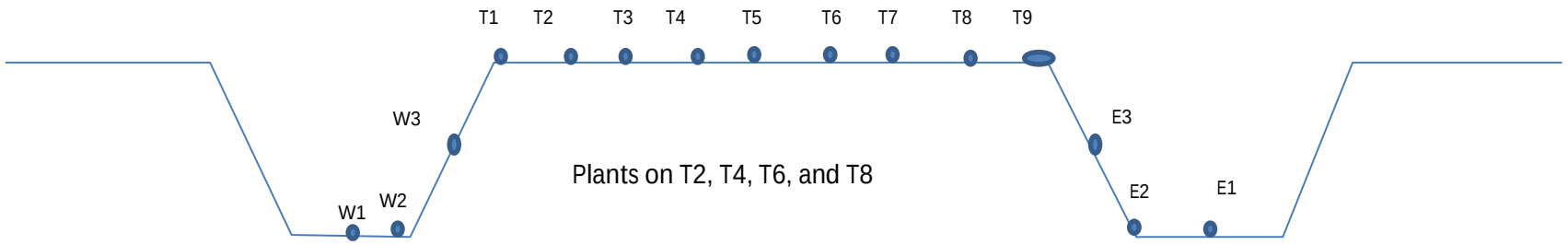
Manzanita	West														East
Blk 2B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	4.12	4.07	3.5	5.51	6.76	4.48	10.6	4.45	5.31	1.03	2.04	6.45	3.96	x
Temp (F)	x	71.2	69.6	68.4	67.1	66.9	66.2	66	66.9	66.2	67.3	68	68.4	68.9	x
% Moisture	x	24.5	24.2	15.1	20.2	17.9	18.8	13.1	19.7	24	16.8	14.9	18.8	21.4	x

Salinity Data - Top 3 inches

Manzanita Block 2

Using 5TE Sensor and ProCheck

Salinity +8



Block 2A - 15 May 2012

Manzanita	West													East
Blk 2A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	4.85	5.38	4.32	2.05	3.1	7.69	11.78	6.71	4.44	4.96	6.2	4.5	4.78	x
Temp (F)	x	75.2	74.8	76.1	75.9	75.2	73.2	72.9	72	72.3	72.5	75	74.8	74.7	x
% Moisture	x	21.4	23.6	20.6	20.1	23.2	23.8	26.9	23.6	22.7	23.5	22.1	22.4	28.8	x

Block 2B - 15 May 2012

Manzanita	West													East
Blk 2B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	7.57	3.66	7.28	5.79	5.85	7.91	7.77	7.57	7.26	7.05	8.13	7.58	5.47	x
Temp (F)	x	70.9	71.2	73.4	73.8	73.2	72.1	77.8	71.8	72.1	72.5	72.1	72.1	72.1	x
% Moisture	x	23.4	21.4	20.2	20.6	20.4	20.2	21.3	21.4	20.8	17	16	8.3	21.4	x

Block 2A - 5 July 2012

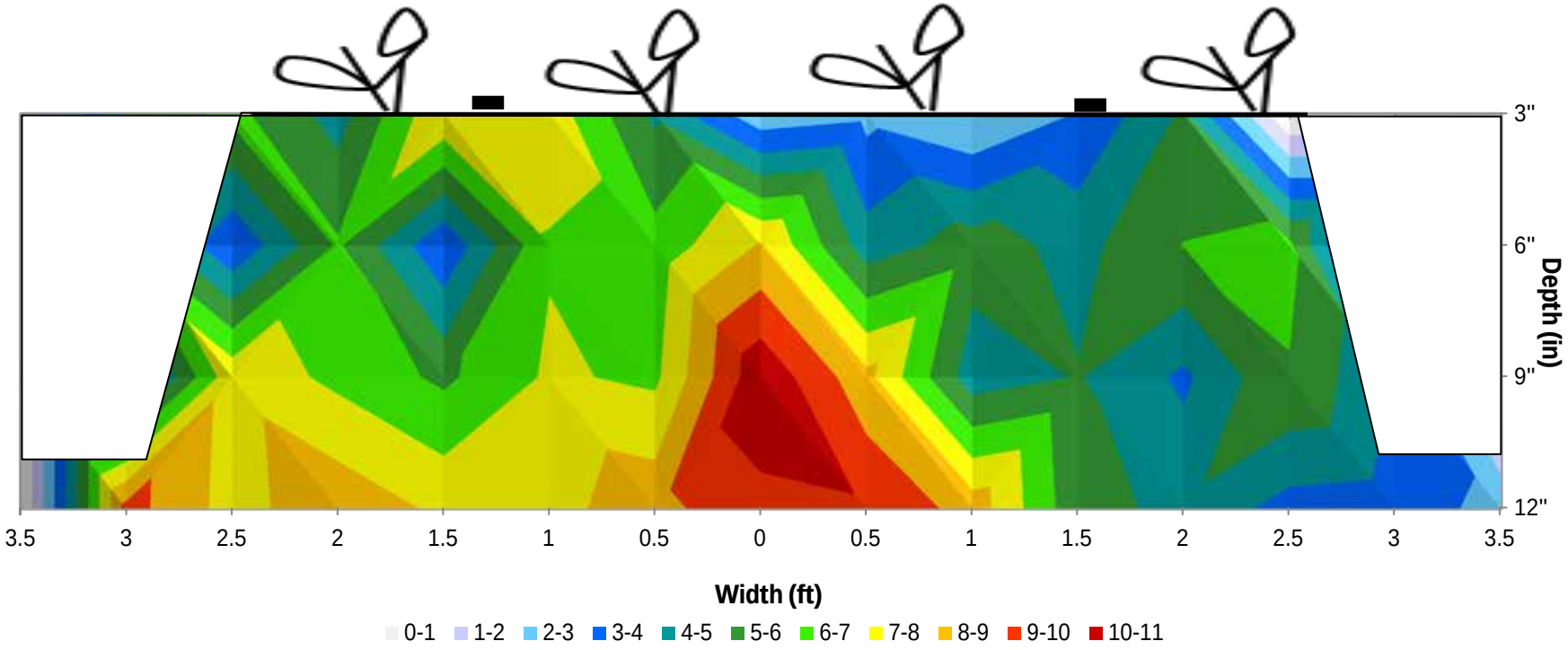
Manzanita	West													East
Blk 2A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	7.7	3.45	7.29	0.86	5.75	7.22	10.55	9.44	3.74	7.93	6.52	5.5	9.25	X
Temp (F)	X	70.3	70.4	70.9	70.7	70	70.2	71.2	70.9	70.7	70.5	70.3	70.5	70.5	X
% Moisture	X	20.9	23.1	23.4	25	25.2	25.2	25.5	22	23.1	23.4	21.1	25	28.2	X

Block 2B - 5 July 2012

Manzanita	West													East
Blk 2B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	7.57	1.19	6.12	6.25	4.13	6.46	8.33	7.08	6.05	5.94	7.97	8.52	7.78	X
Temp (F)	X	74.8	75.7	76.6	76.6	75.2	74	73.8	73.4	73.6	73.6	73.6	73.8	74.1	X
% Moisture	X	23.9	21.3	24	25.4	23.1	21.4	20.9	21.7	19.4	22.4	21.4	22.3	25.3	X

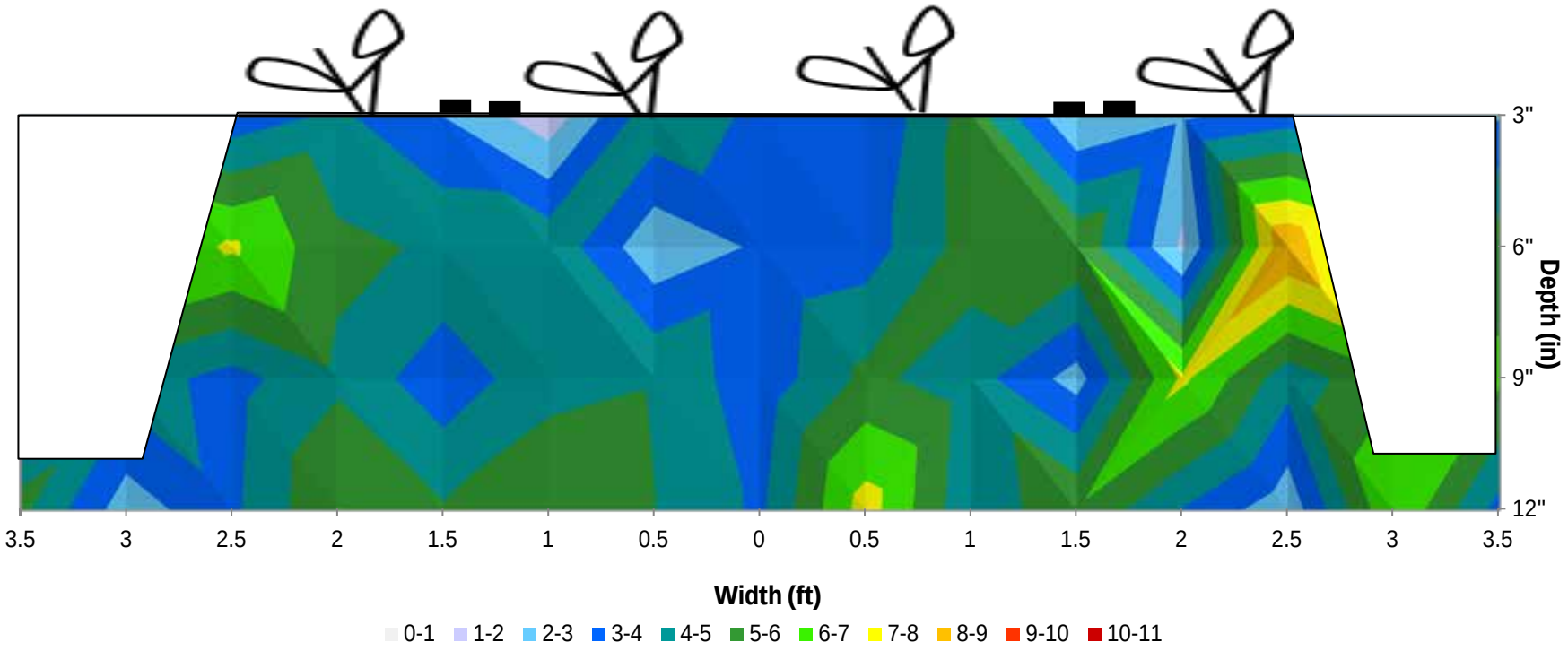
Manzanita Block 2 A Reduced Sprinkler - 2 Tape
EC (dS/m) 1/6/12

Average EC 5.9 dS/m



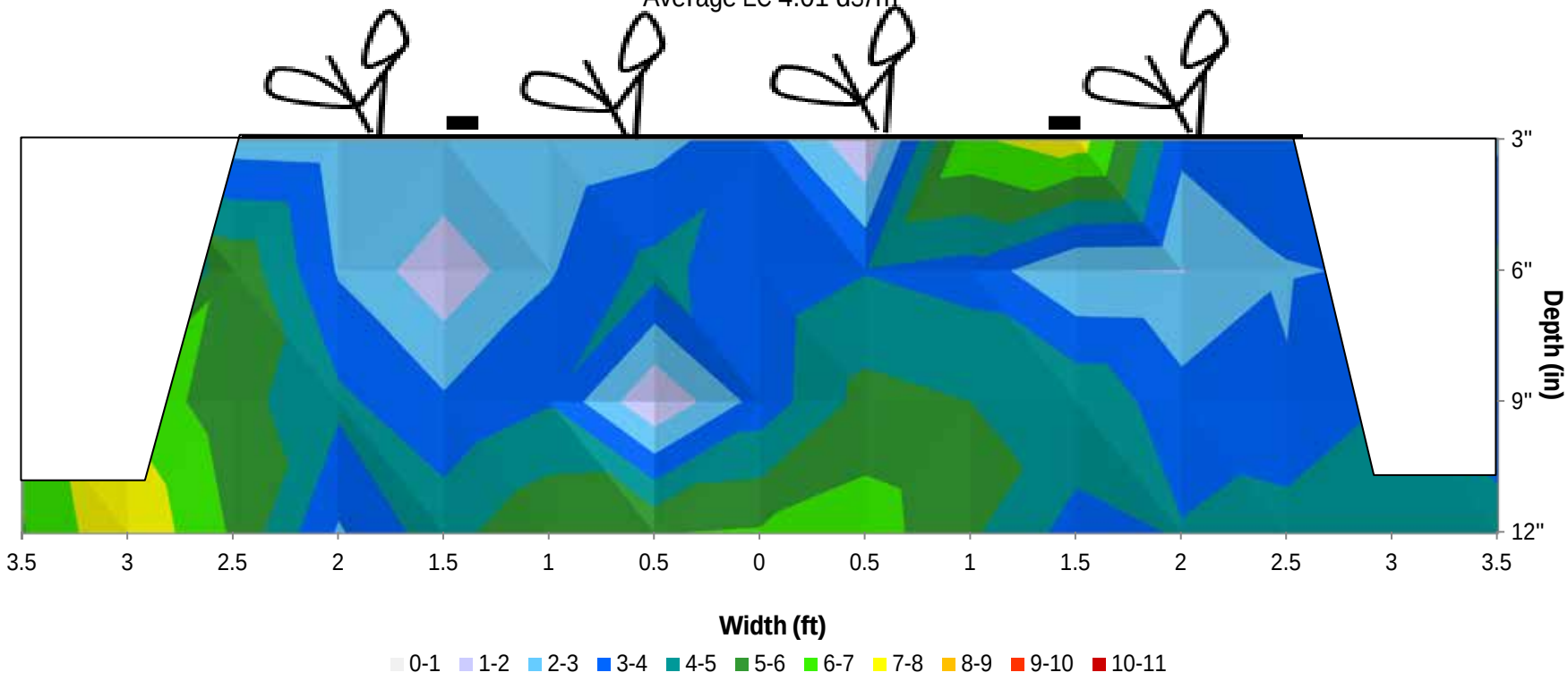
Manzanita Block 2 A Reduced Sprinkler - 4 Tape
EC (dS/m) - 2/25/12

Average EC 4.41 dS/m



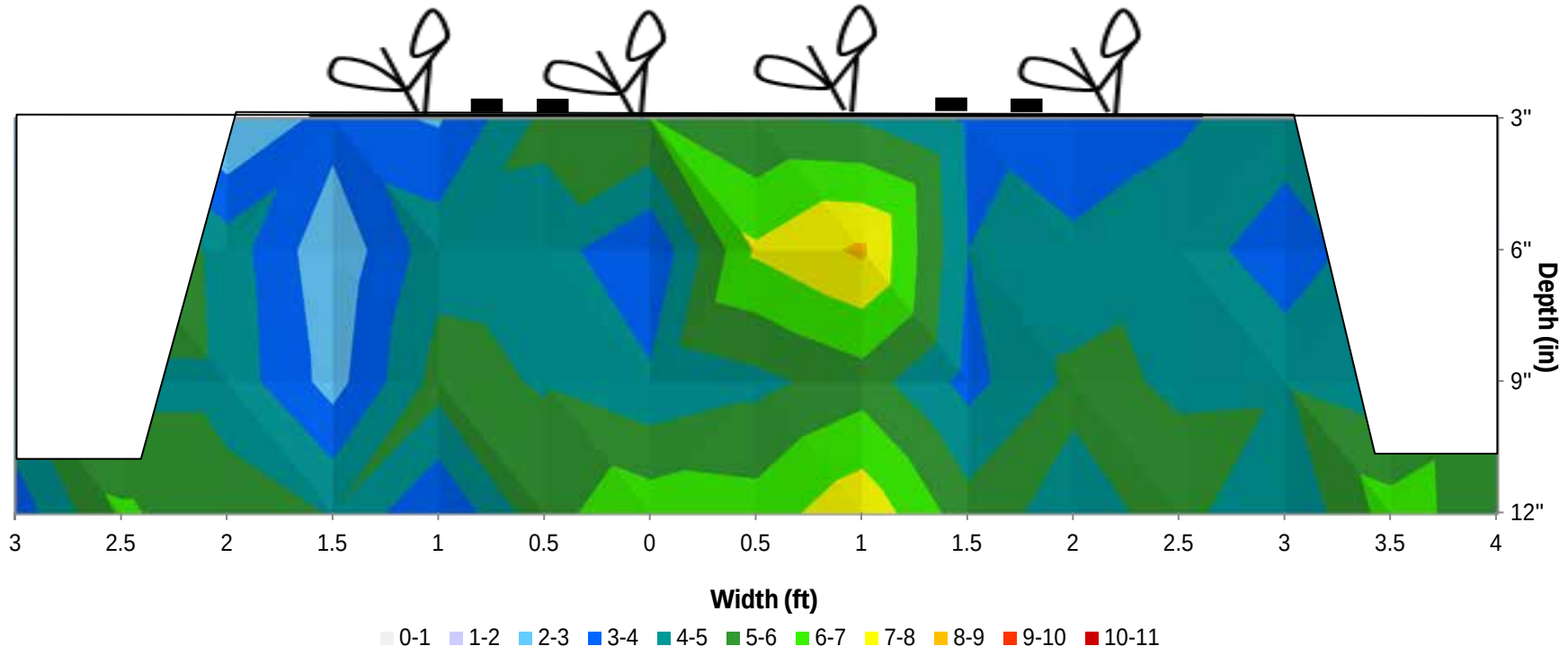
Manzanita Block 2A Reduced Sprinkler - 2 Tape
EC (dS/m) 4/17/12

Average EC 4.01 dS/m



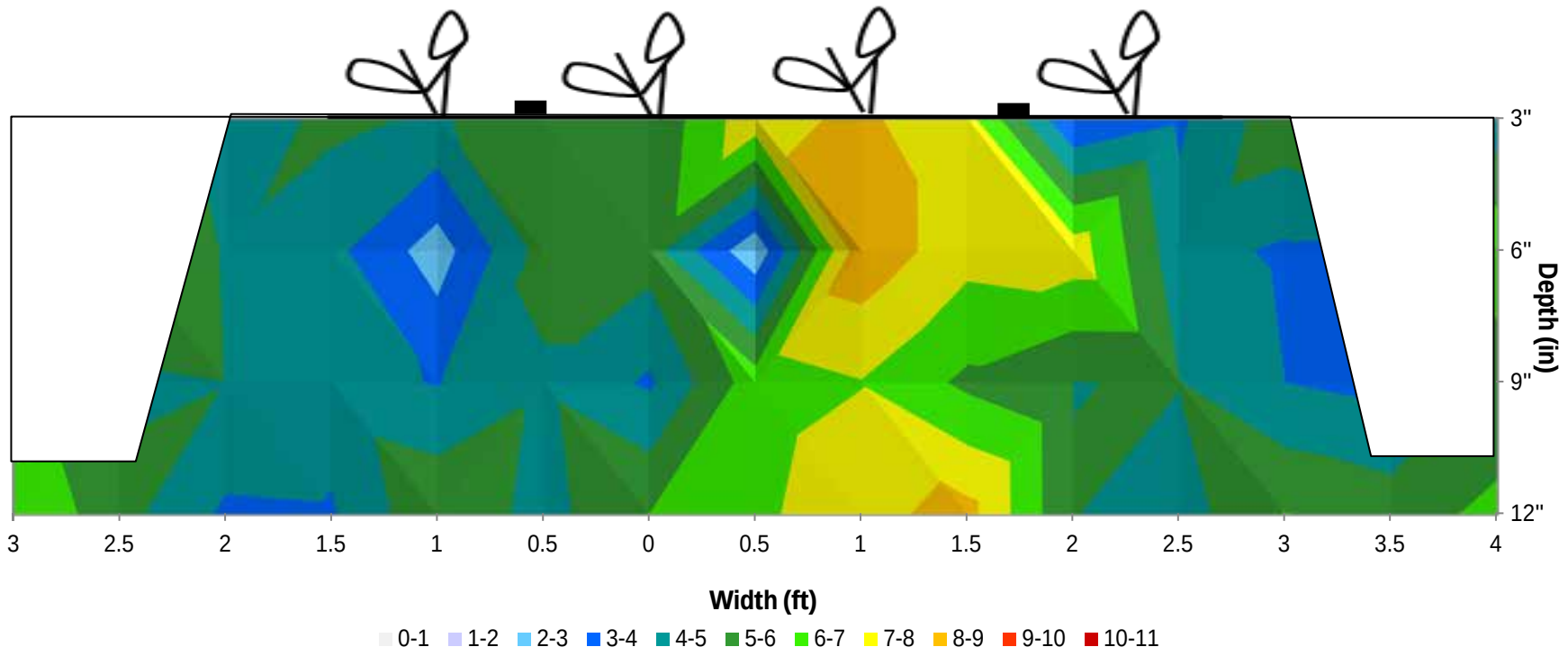
Manzanita Block 2A - 4 Tape Reduced Sprinkler
EC (dS/m) - 5/15/12

Average EC 4.73 dS/m

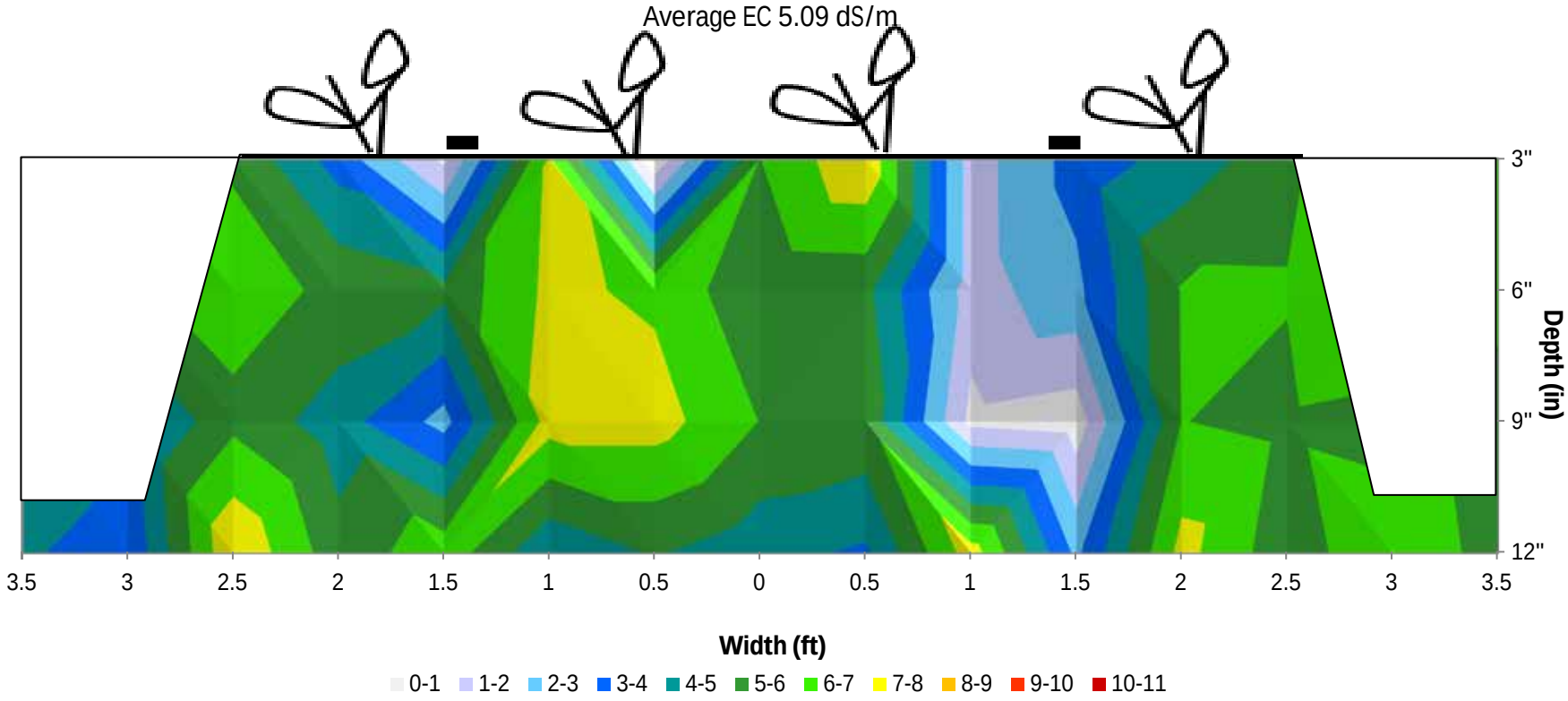


Manzanita Block 2A - 2 Tape Reduced Sprinkler
EC (dS/m) - 5/15/12

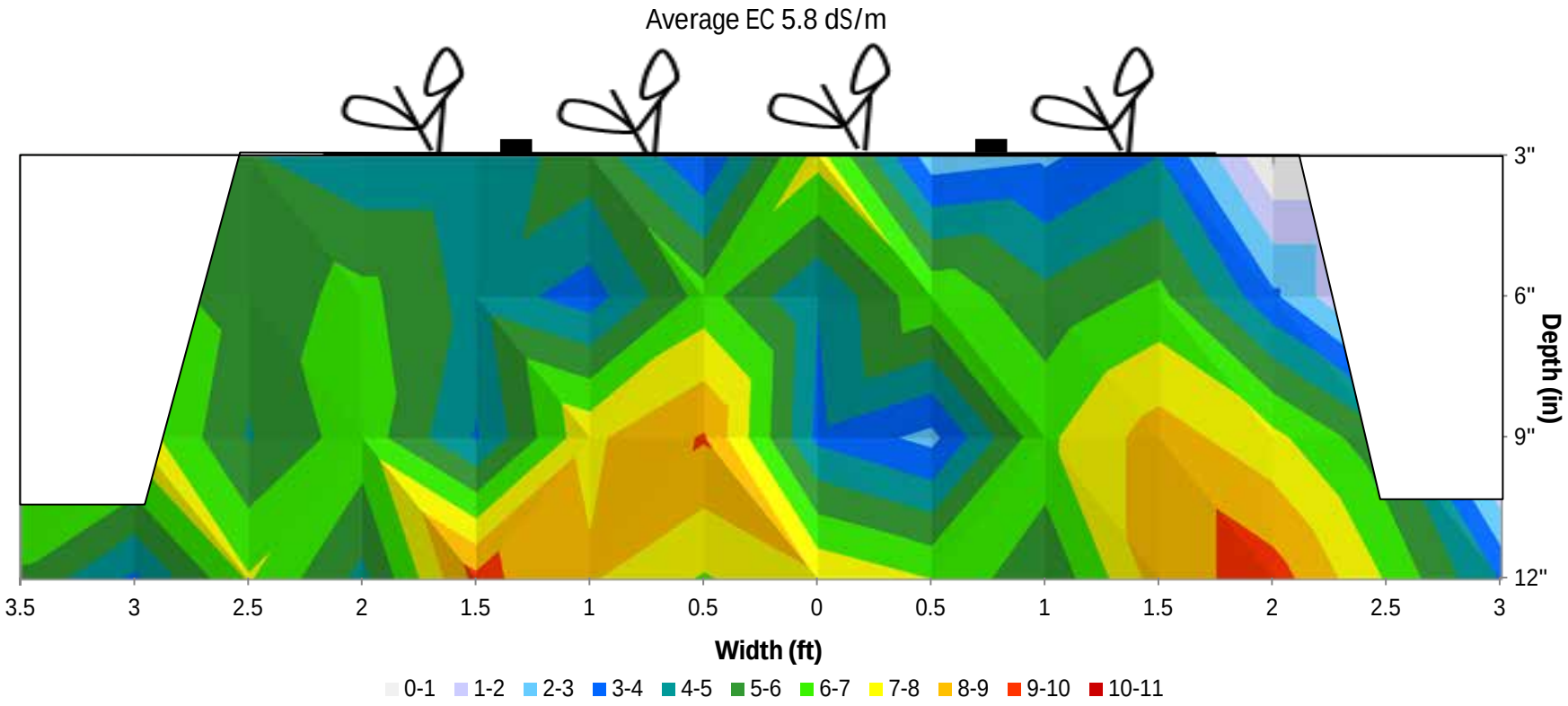
Average EC 5.28 dS/m

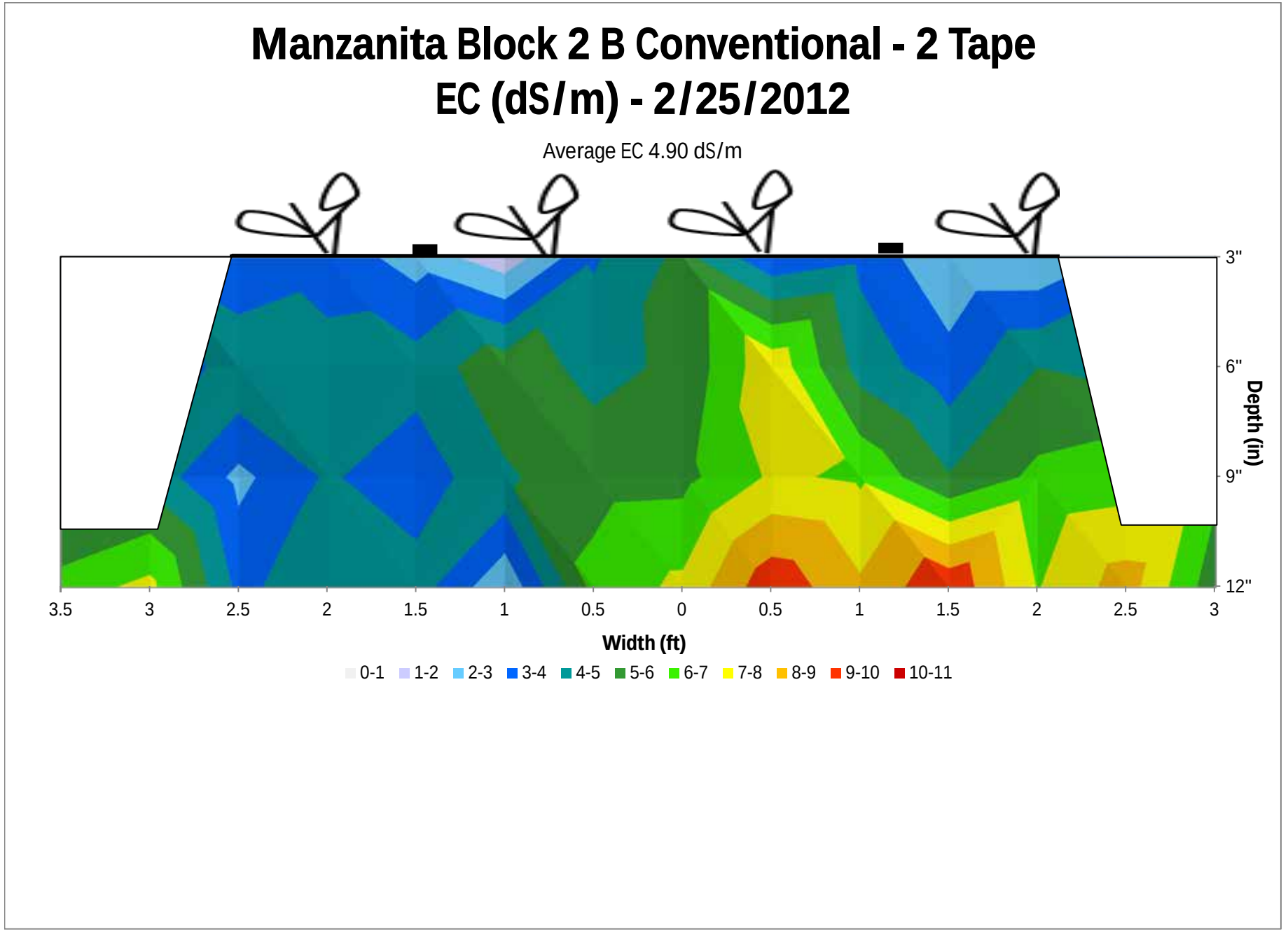


Manzanita Block 2 A Reduced Sprinkler - 2 Tape
EC (dS/m) 5/7/12



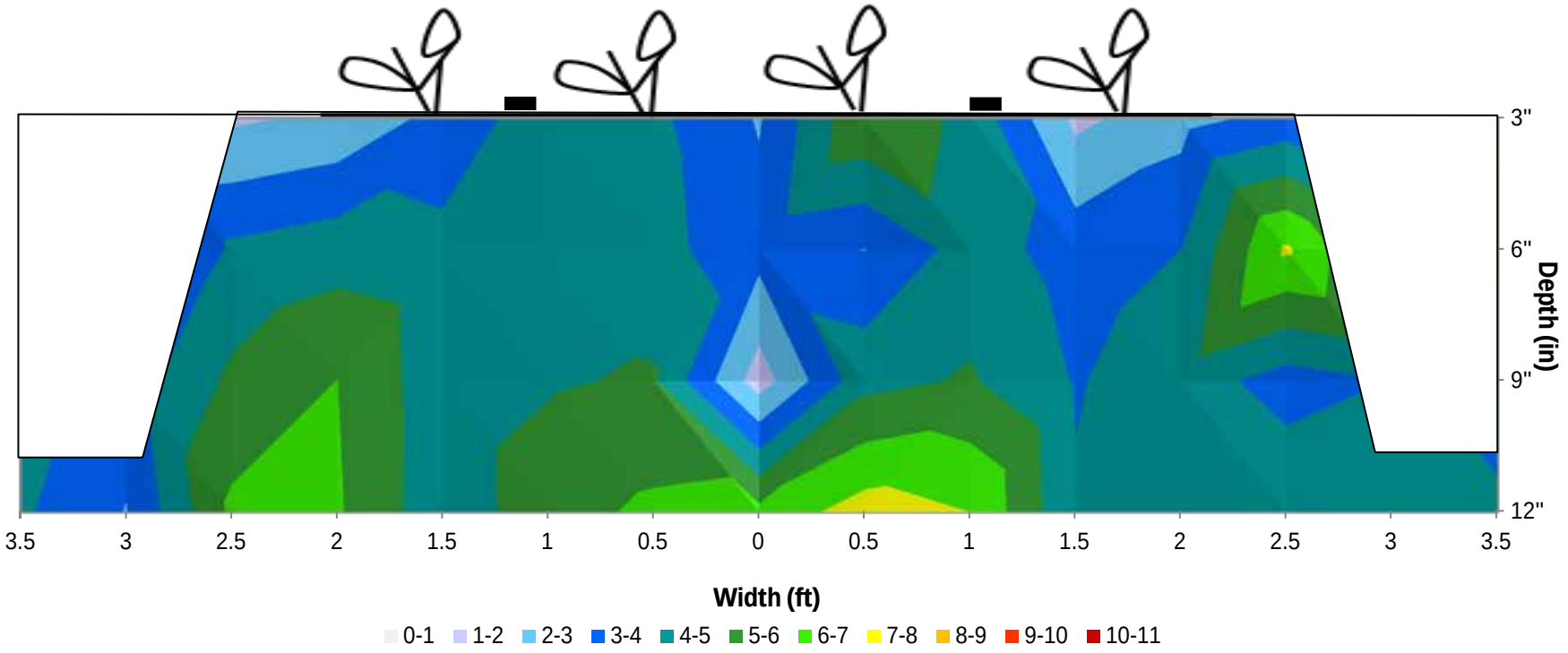
Manzanita Block 2 B Reduced Sprinkler - 2 Tape
EC (dS/m) 1/6/12




Manzanita Block 2 B Conventional - 2 Tape
EC (dS/m) - 2/25/2012
Average EC 4.90 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11

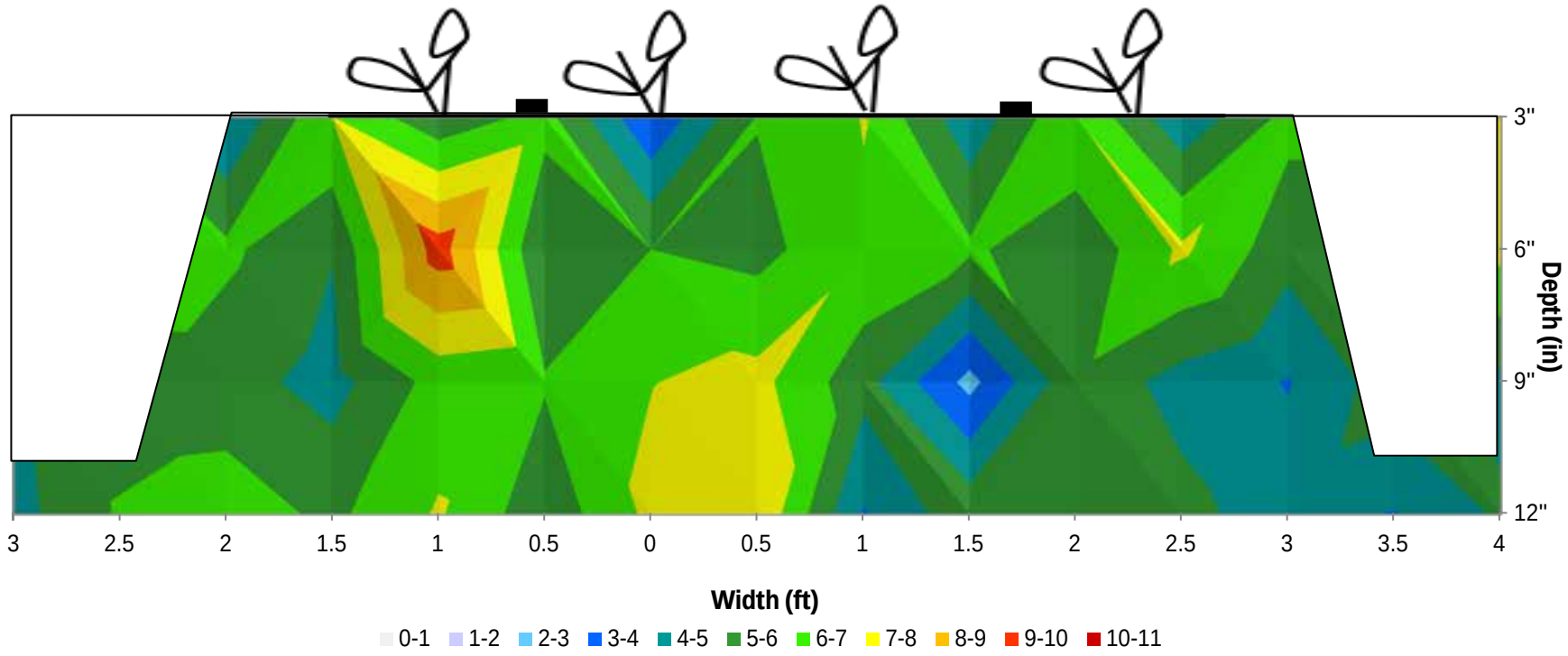
Manzanita Block 2B Conventional - 2 Tape
EC (dS/m) 4/17/12

Average EC 4.27 dS/m



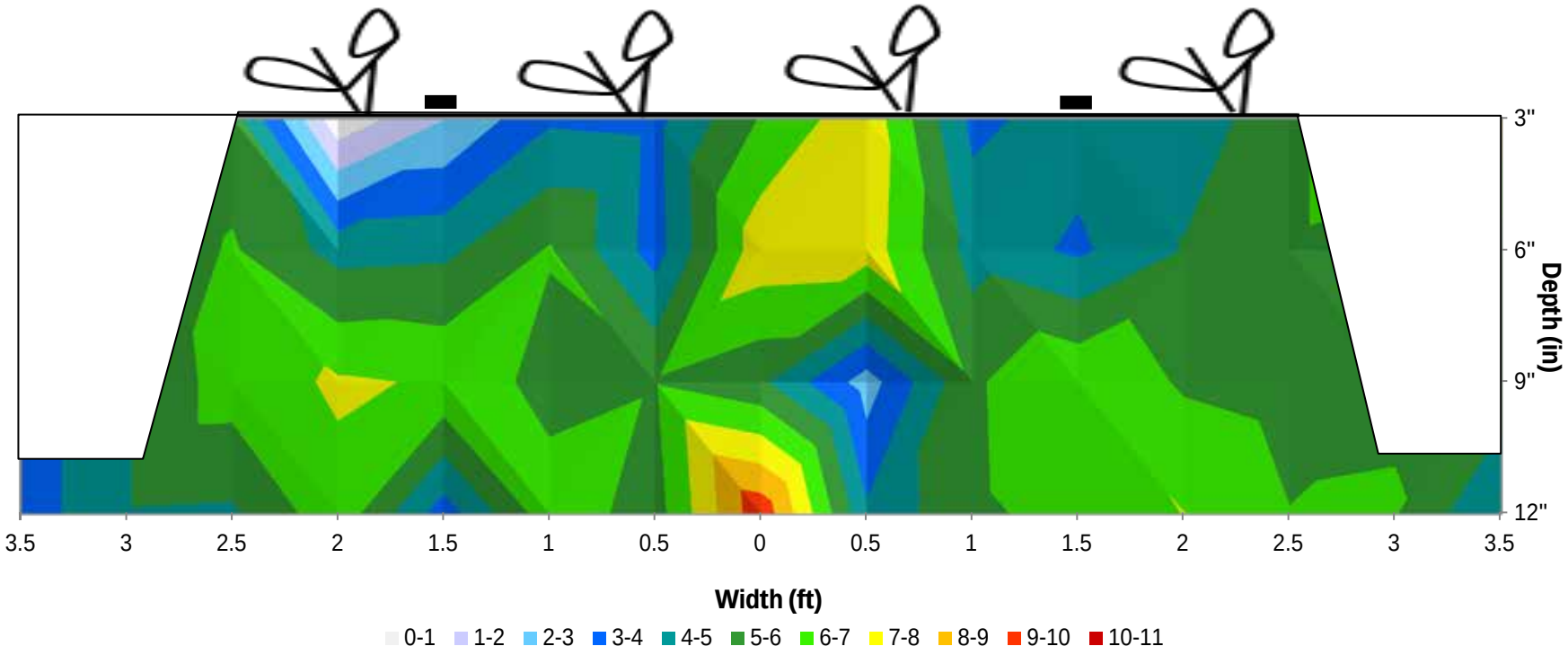
Manzanita Block 2B - 2 Tape Conventional
EC (dS/m) - 5/15/12

Average EC 5.63 dS/m



Manzanita Block 2 B Conventional - 2 Tape
EC (dS/m) 5/7/12

Average EC 5.30 dS/m



Manzanita - Block 14A

Reduced Sprinkler

1/12/12– 74 DAP

2/8/12– 101 DAP

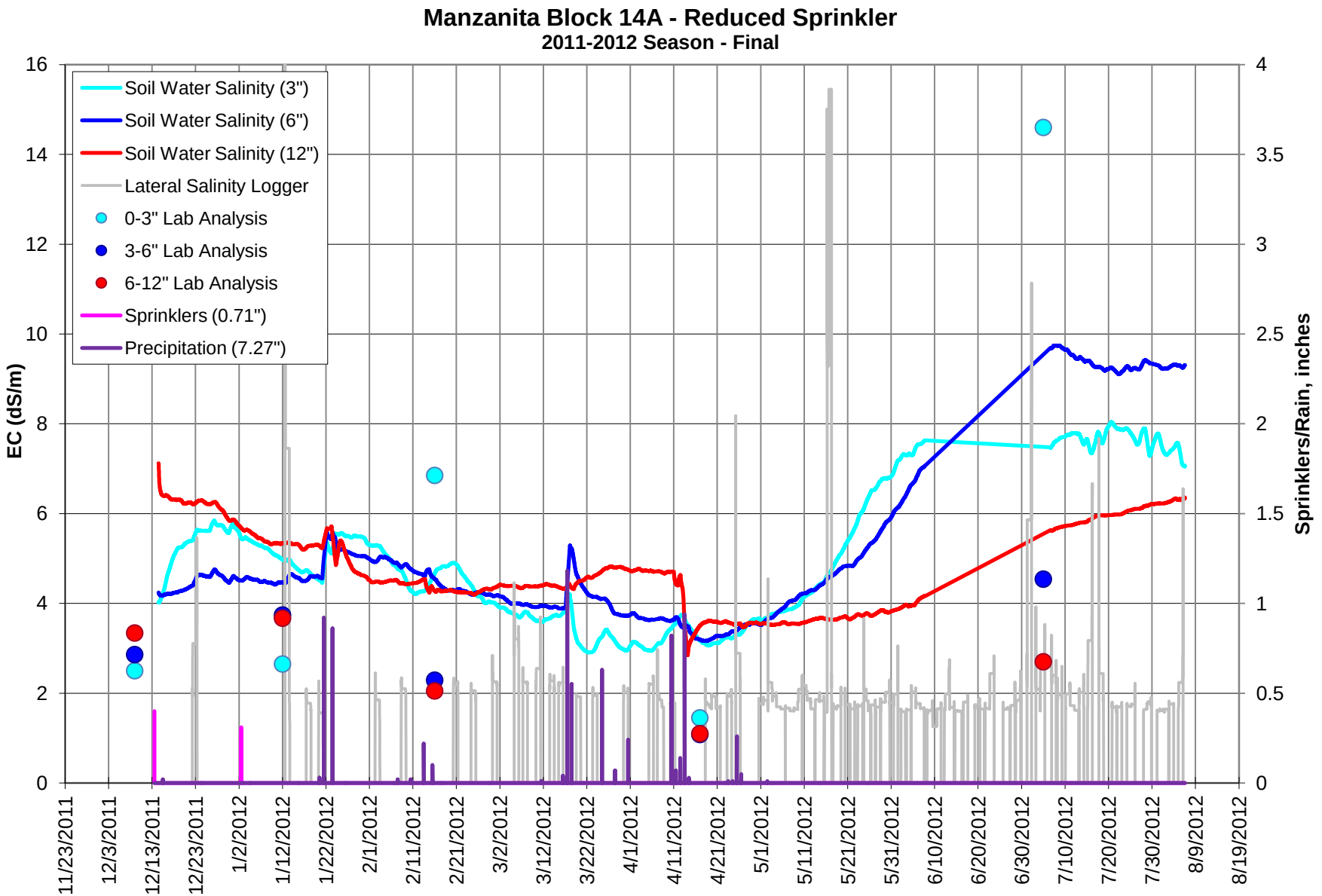
4/6/12– 159 DAP

5/15/12– 198 DAP

Manzanita - Block 14A

Reduced Sprinkler

7/5/12– 249 DAP


Manzanita Block 14A - Reduced Sprinkler
2011-2012 Season - Final
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (0.71")
Precipitation (7.27")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
11/23/2011
12/3/2011
12/13/2011
12/23/2011
1/2/2012
1/12/2012
1/22/2012
2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012
7/20/2012
7/30/2012
8/9/2012
8/19/2012

Manzanita - Block 14B

Conventional

1/12/12– 74 DAP

2/8/12– 101 DAP

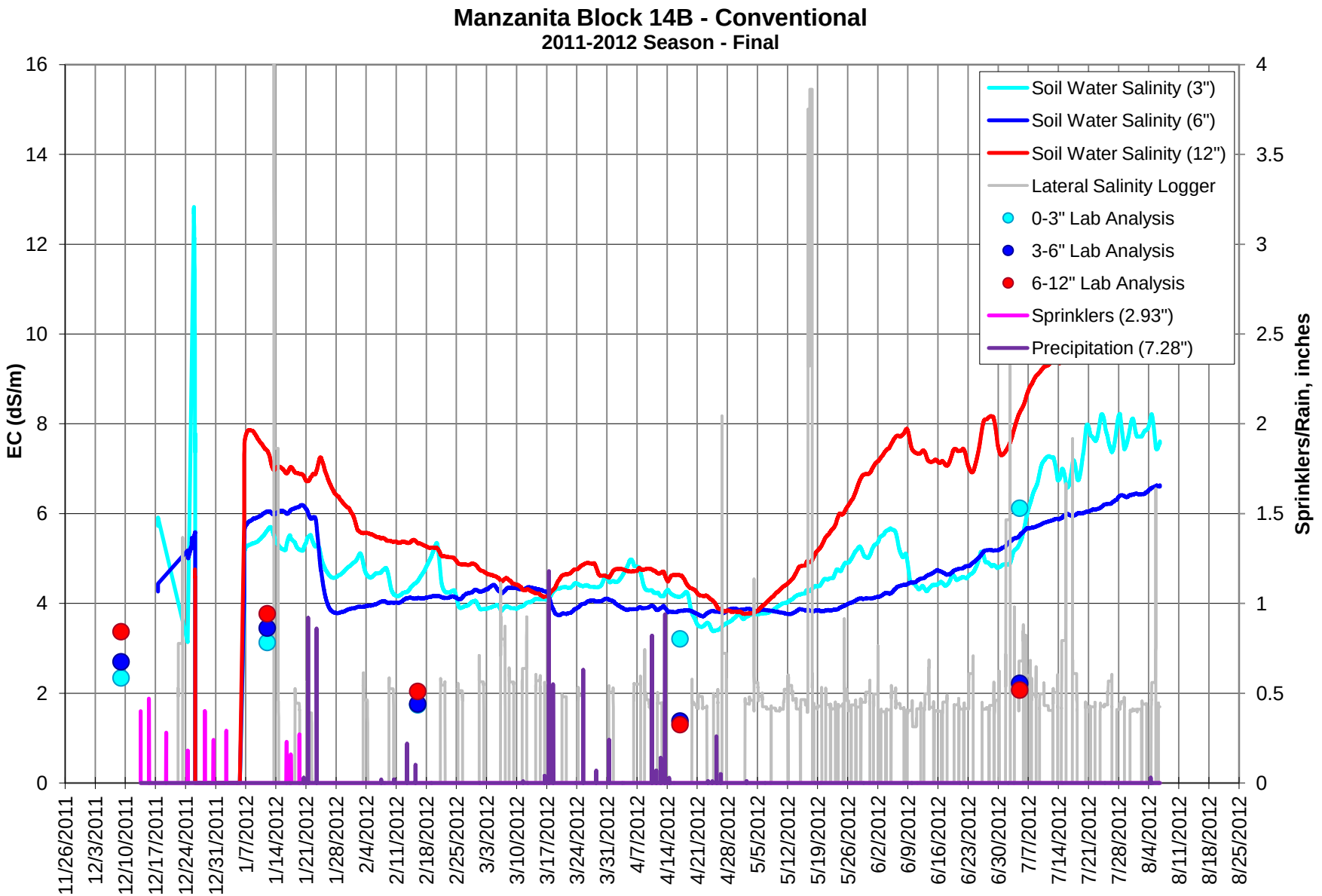
4/6/12– 159 DAP

5/15/12– 198 DAP

Manzanita - Block 14B

Conventional

7/5/12– 250 DAP


Manzanita Block 14B - Conventional
2011-2012 Season - Final
EC (dS/m)
Sprinklers/Rain, inches
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (2.93")
Precipitation (7.28")
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
11/26/2011
12/3/2011
12/10/2011
12/17/2011
12/24/2011
12/31/2011
1/7/2012
1/14/2012
1/21/2012
1/28/2012
2/4/2012
2/11/2012
2/18/2012
2/25/2012
3/3/2012
3/10/2012
3/17/2012
3/24/2012
3/31/2012
4/7/2012
4/14/2012
4/21/2012
4/28/2012
5/5/2012
5/12/2012
5/19/2012
5/26/2012
6/2/2012
6/9/2012
6/16/2012
6/23/2012
6/30/2012
7/7/2012
7/14/2012
7/21/2012
7/28/2012
8/4/2012
8/11/2012
8/18/2012
8/25/2012

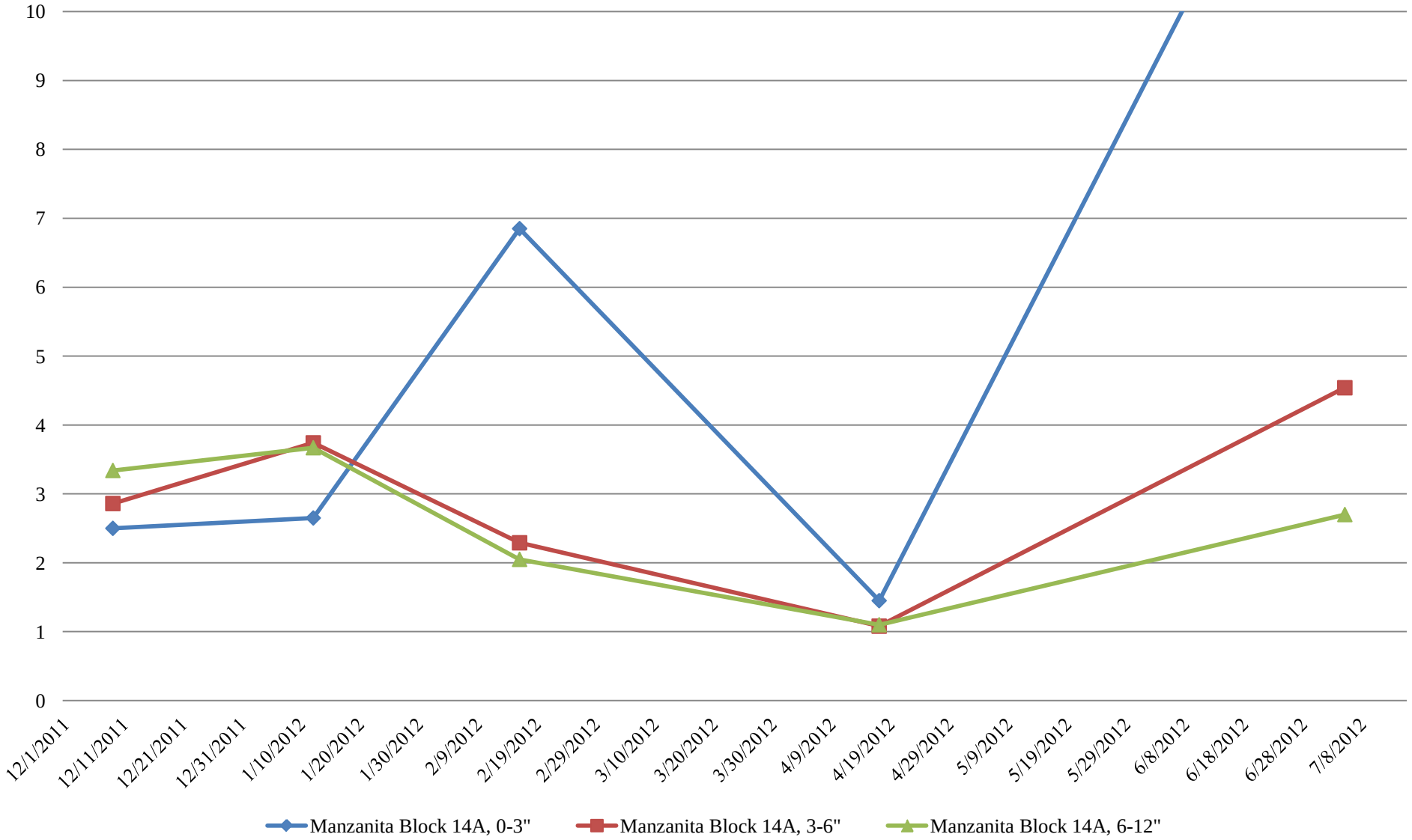
Date:		12/9/2011			1/12/2012			2/16/2012			4/17/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	2.50	106.40	DLS	2.65	79.45	DLS	6.85	43.75	DLS	1.45	46.90
	3-6"	DLS	2.86	103.60	DLS	3.74	142.10	DLS	2.29	44.45	DLS	1.08	35.35
	6-12"	DLS	3.34	109.20	DLS	3.67	116.55	DLS	2.05	57.05	DLS	1.10	39.90
Block B	0-3"	SSS	2.43	125.65	SSS	3.13	53.90	SSS	1.74	39.20	SSS	3.21	88.90
	3-6"	SSS	2.70	90.65	SSS	3.45	117.95	SSS	1.76	26.60	SSS	1.38	64.40
	6-12"	SSS	3.37	110.25	SSS	3.77	89.60	SSS	2.04	39.55	SSS	1.30	48.30

Date:		7/5/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	14.60	854.00
	3-6"	DLS	4.54	278.95
	6-12"	DLS	2.70	114.10
Block B	0-3"	SSS	6.12	567.00
	3-6"	SSS	2.22	107.80
	6-12"	SSS	2.07	63.70

Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

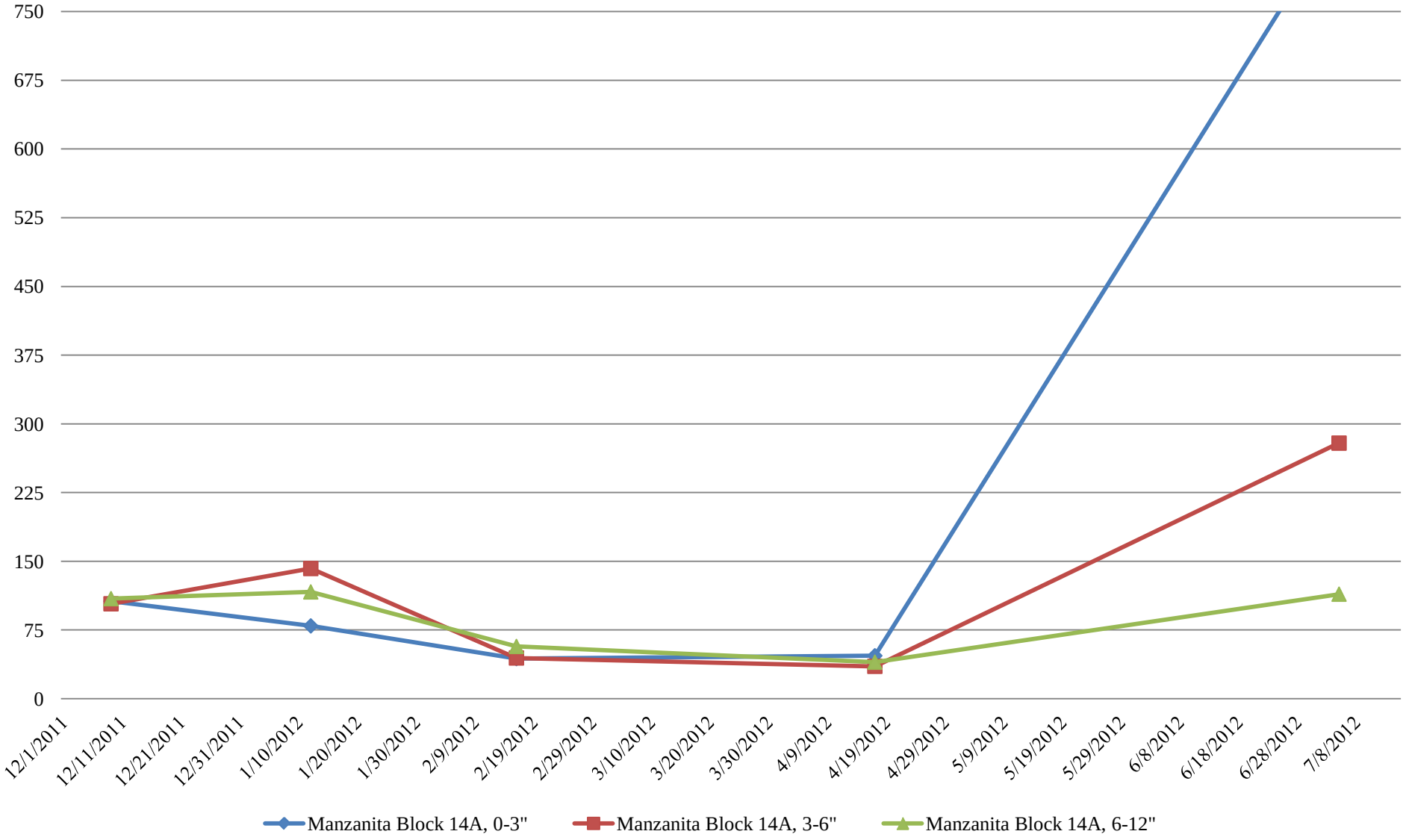
Manzanita Block 14A

Salinity



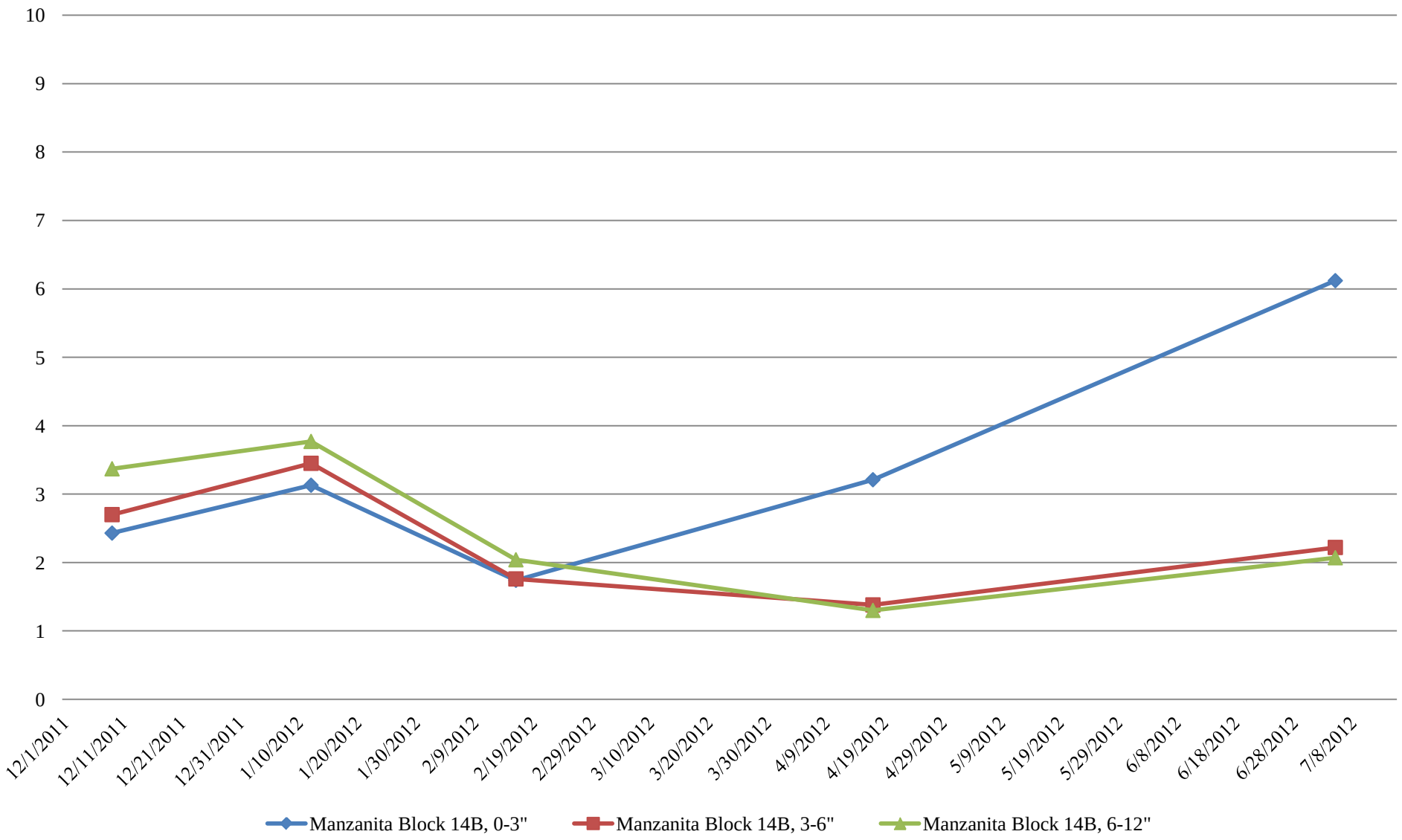
Manzanita Block 14A

Chloride



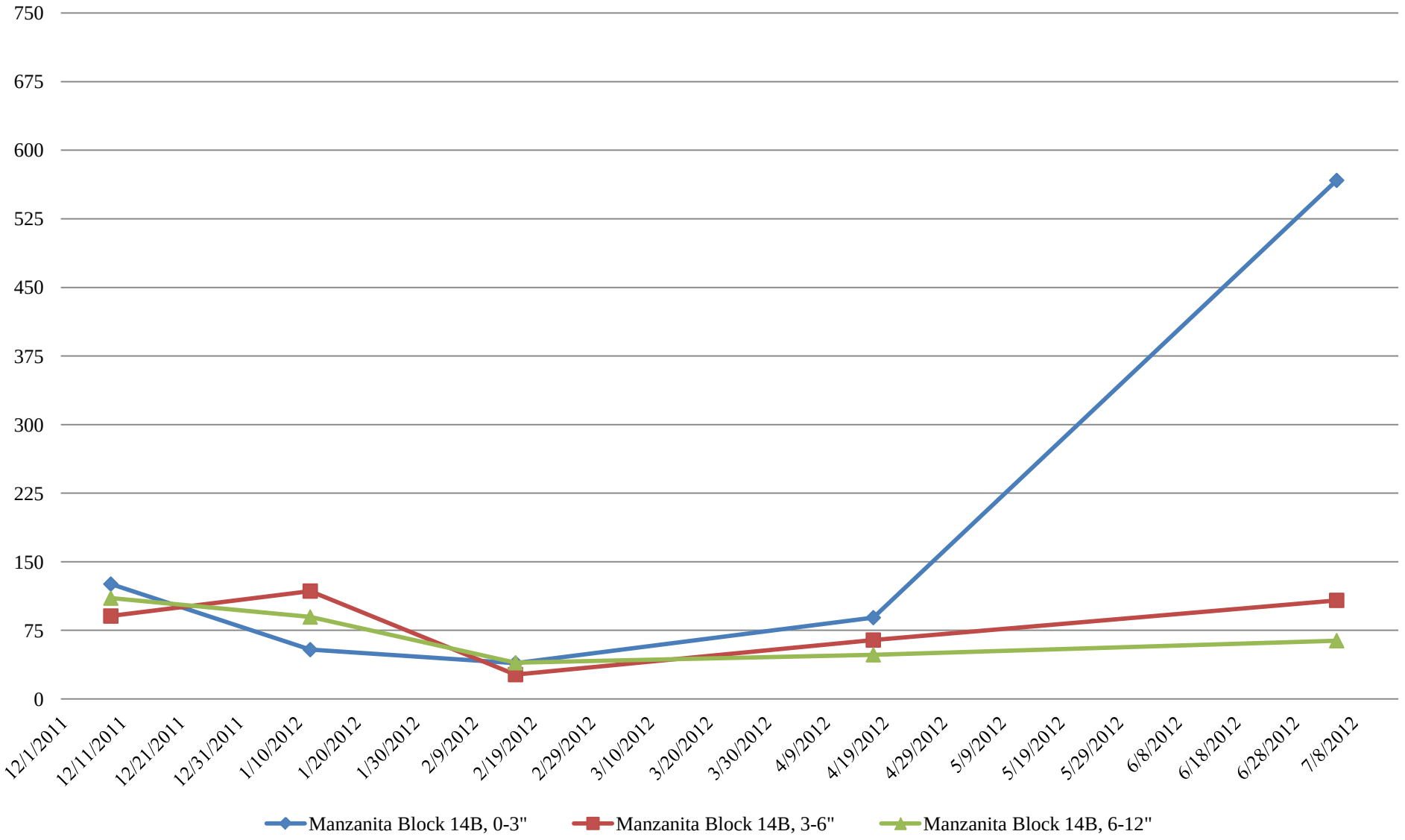
Manzanita Block 14B

Salinity



Manzanita Block 14B

Chloride

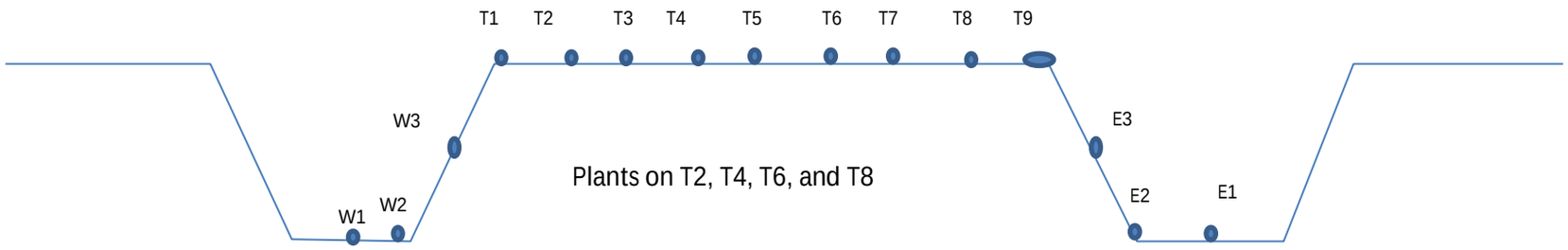


Salinity Data - Top 3 inches

Manzanita Block 14

Using 5TE Sensor and ProCheck

Salinity +8



Block 14A - 12 Jan. 2012

Manzanita	West													East
Blk 14A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	8.32	7.5	4.89	5	4.85	5.67	11.85	7.3	5.76	5.51	5.6	5.47	12.1	x
Temp (F)	x	64	64.2	64.6	65.3	66.2	65.5	64.9	65.1	64	64.2	64.2	64.2	63.7	x
% Moisture	x	18.5	18.5	17.8	15.2	26.3	16.7	12.4	17	29.5	21.6	15.6	16.9	18	x

Block 14B - 12 Jan. 2012

Manzanita	West													East
Blk 14B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	6.75	6.67	4.92	4.6	5.6	4.9	8.48	6.75	5.13	5.89	4	5.83	3.28	x
Temp (F)	x	63	63.1	64.6	65.5	64.4	64	63.9	63.5	63.1	63.7	63.7	63.5	63.1	x
% Moisture	x	21.1	22.1	20.6	28.1	25.4	18.6	19.5	24.5	30.2	17.9	18.6	18.9	18.2	x

Block 14A - 19 Jan. 2012

Manzanita	West													East
Blk 14A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	11.08	4.67	4.11	6.41	5.39	2.1	10.08	6.05	4.77	7.63	5.83	7.89	7.04	x
Temp (F)	x	55	54.7	54.7	55.4	56.3	57.6	58.6	59.4	59.5	59	59	58.5	59	x
% Moisture	x	19.2	21.1	18.3	18.7	18.8	14.7	16.7	13.5	21.1	20.1	17.6	20.7	19.4	x

Block 14B - 19 Jan. 2012

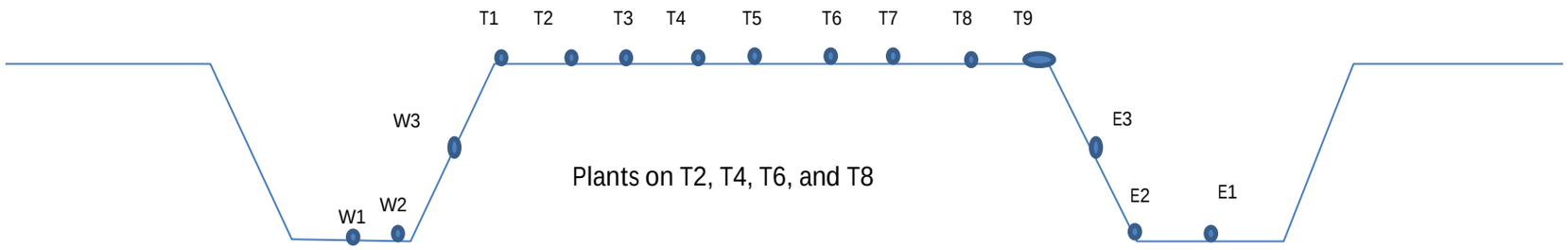
Manzanita	West													East
Blk 14B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	12.19	5.43	7.03	4.87	4.61	5.67	12.8	3.65	5.18	5.25	4.07	4.06	6.5	x
Temp (F)	x	53.6	53.4	53.8	54.9	55.4	56.3	58.6	59.7	59.9	59.9	59.5	59.7	59.7	x
% Moisture	x	18.9	23.1	20.6	22.7	20.5	21.6	18.8	23.2	21.4	20.4	20.1	19.3	21.3	x

Salinity Data - Top 3 inches

Manzanita Block 14

Using 5TE Sensor and ProCheck

Salinity +8



Block 14A - 8 Feb. 2012

Manzanita	West													East
Blk 14A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	6.56	4.48	4.56	6.4	6.95	2.98	12.44	7.31	3.18	6.49	7.53	7	7.08	7.29
Temp (F)	x	79	78.1	77.5	77	75.7	74.3	74.7	75.4	74.7	74.8	75.6	75.7	75	73.8
% Moisture	x	19.4	19.9	16	20.8	18.6	15.1	13.5	16.9	21.6	17	16.8	16.3	21.4	15

Block 14B - 8 Feb. 2012

Manzanita	West													East
Blk 14B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	3.37	2.76	3.3	2.26	3.82	3.87	4.45	6.72	4.7	6.29	4.46	4.69	4.74	5.8	2.87
Temp (F)	79.9	80.4	79.7	79.7	77	73.8	73.2	73.4	74.1	73.2	72.9	72.3	72.3	72.1	73.4
% Moisture	16.8	21.4	24.5	27.4	25.6	21.6	17.4	19.9	22.8	21.8	16.3	13.4	16.1	19.1	12.9

Block 14A - 6 April 2012

Manzanita	West													East
Blk 14A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	3.37	4.44	3.37	3.19	4.79	2.45	5.48	2	2.89	4.14	4.82	2.49	5.52	x
Temp (F)	x	68.2	66.7	66	66	67.6	69.1	69.3	70	68.9	69.6	70.5	72.1	72.7	x
% Moisture	x	20.1	17	9.6	15	16.1	20.5	16.6	17.4	16.3	11.4	15.8	17.1	22.2	x

Block 14B - 6 April 2012

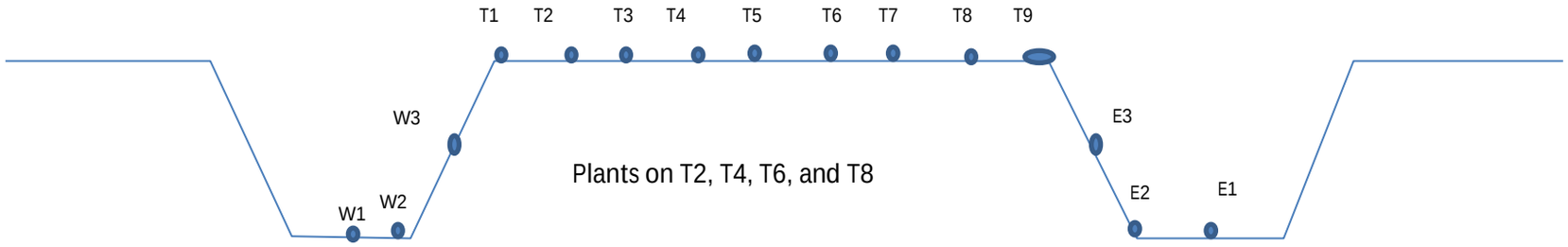
Manzanita	West													East
Blk 14B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	3.46	3.39	2.86	4.69	6.49	5.21	9.88	4.56	6.33	3.75	9.19	6.64	7.81	x
Temp (F)	x	66.7	65.7	64	63.3	64.2	65.5	66.4	66.2	64.8	64.4	64.8	64.8	69.1	x
% Moisture	x	19.6	20.3	21	19.9	19.2	16.4	16.7	20.8	19.1	16.3	17.4	17.4	17.9	x

Salinity Data - Top 3 inches

Manzanita Block 14

Using 5TE Sensor and ProCheck

Salinity +8



Block 14A - 15 May 2012

Manzanita	West													East
Blk 14A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	2.4	3.18	3.63	3.44	5.84	6.68	7.91	3.93	4.41	4.97	3.03	4.55	2.79	x
Temp (F)	x	77.5	77.2	16.3	75.9	75.2	73.6	74.3	76.1	75.4	75.4	75.9	77	78.4	x
% Moisture	x	21.4	22.5	21.9	23	21.2	17.3	17.3	17.4	24.2	24.6	21.7	21.2	23.4	x

Block 14B - 15 May 2012

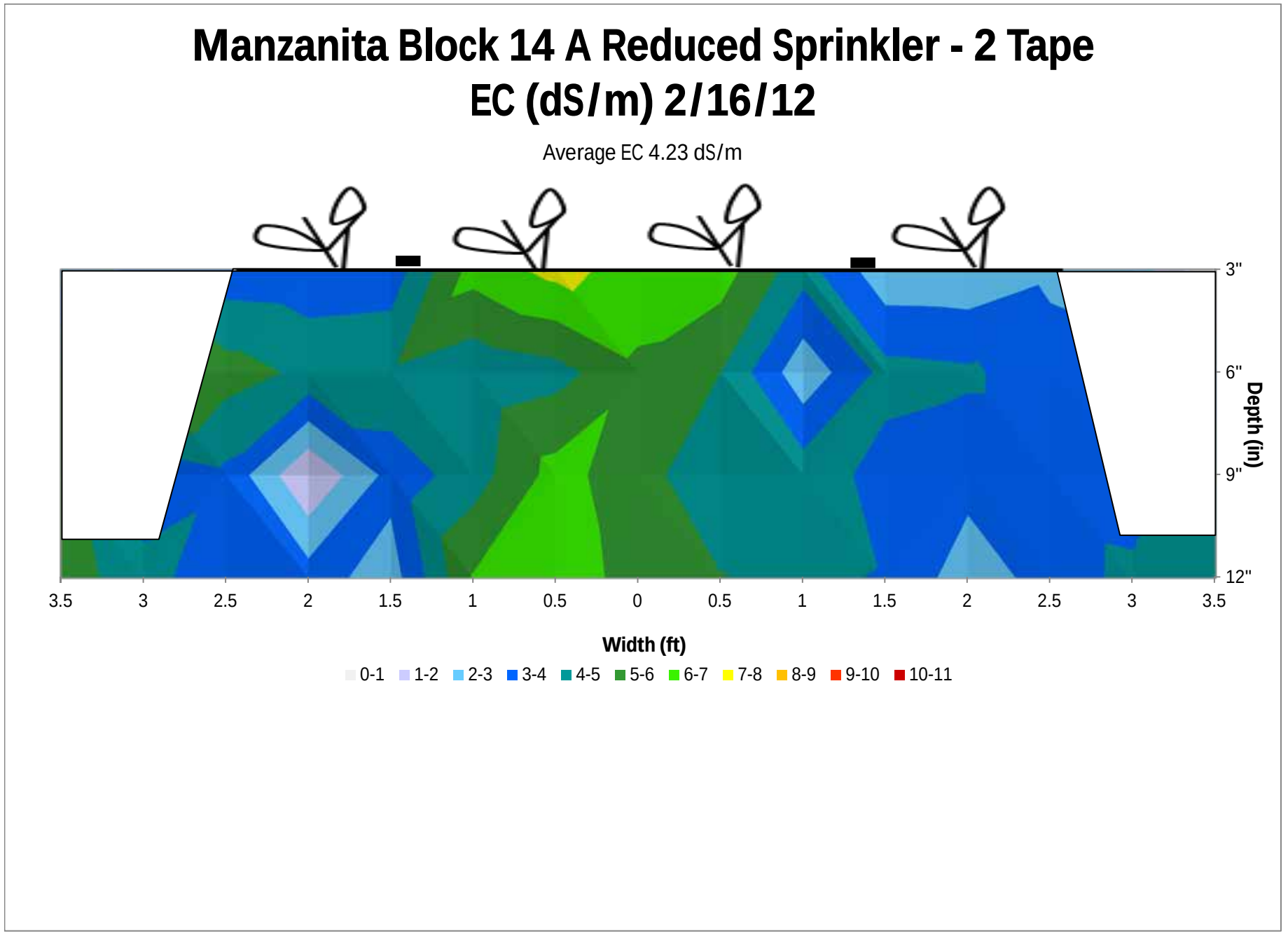
Manzanita	West													East
Blk 14B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	2.81	3.61	2.77	3.82	3.67	6.34	5.42	4.06	3.4	5.62	6	5.56	6.78	x
Temp (F)	x	76.1	74.8	74.1	73	72	71.4	72.5	72.5	71.6	71.1	70.7	72.9	74.7	x
% Moisture	x	27.1	25	24.8	24.4	24.7	23.5	20.7	24.6	24.4	23	19.3	21.1	23	x

Block 14A - 5 July 2012

Manzanita	West													East
Blk 14A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	5.09	5.33	0.53	1.32	5.35	6.62	3.46	4.42	2	2.77	4.93	4.21	5.55	X
Temp (F)	X	83.5	84	84.7	84.9	82.9	81.1	80.2	79.9	79.5	78.8	78.4	78.3	78.3	X
% Moisture	X	18.2	16.1	19.6	18.9	17.4	15.7	12.4	14.2	16.2	18.2	14.9	13	16.5	X

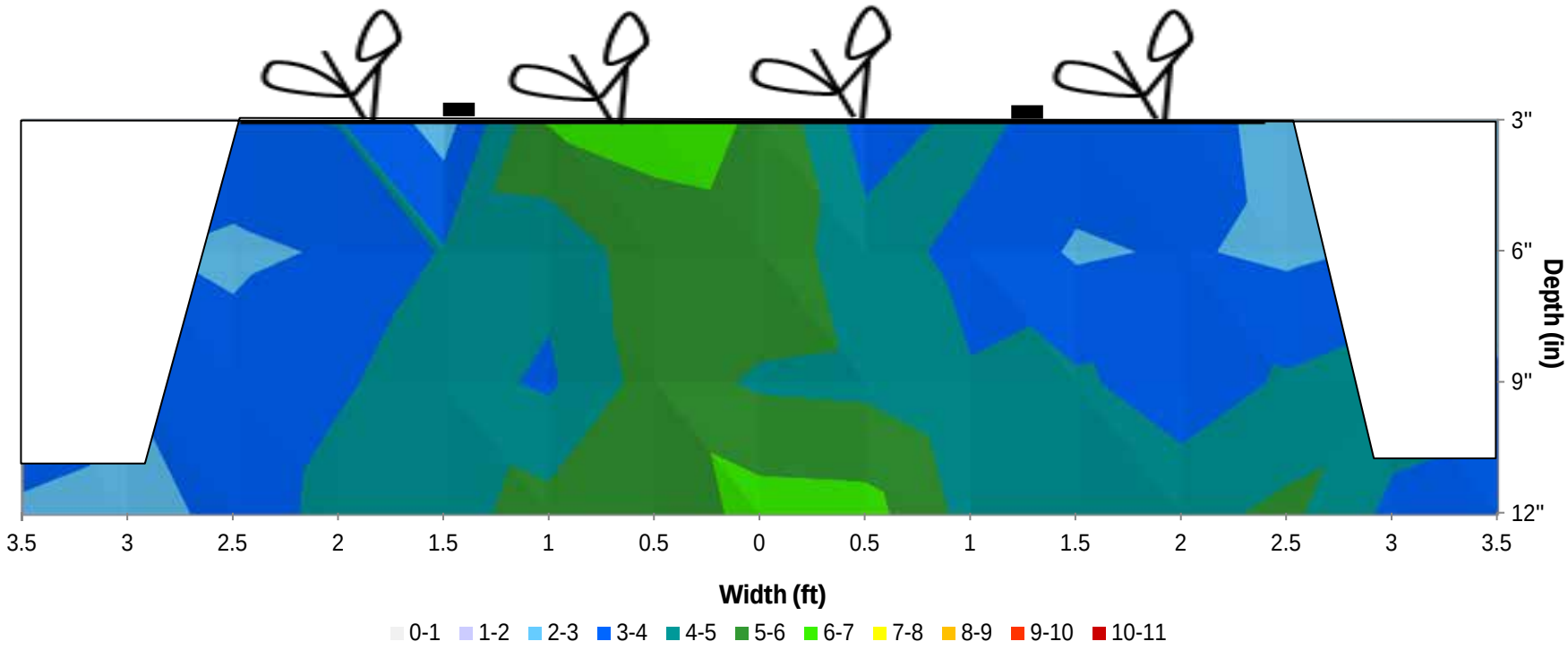
Block 14B - 5 July 2012

Manzanita	West													East
Blk 14B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	5.25	7.09	6.93	2.96	5.59	7.41	3.26	5.92	6.09	3.76	9.44	5.2	3.87	X
Temp (F)	X	75.9	76.1	77.5	79	77.7	77.2	76.6	75.6	75.9	76.6	76.1	75.7	75.7	X
% Moisture	X	23.3	22.4	18.7	21.7	21.1	21.8	19	18.6	20.8	18.4	21.8	19.9	20.2	X


Manzanita Block 14 A Reduced Sprinkler - 2 Tape
EC (dS/m) 2/16/12
Average EC 4.23 dS/m
3"
6"
9"
12"
Depth (in)
3.5 3 2.5 2 1.5 1 0.5 0 0.5 1 1.5 2 2.5 3 3.5
Width (ft)
0-1 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8-9 9-10 10-11

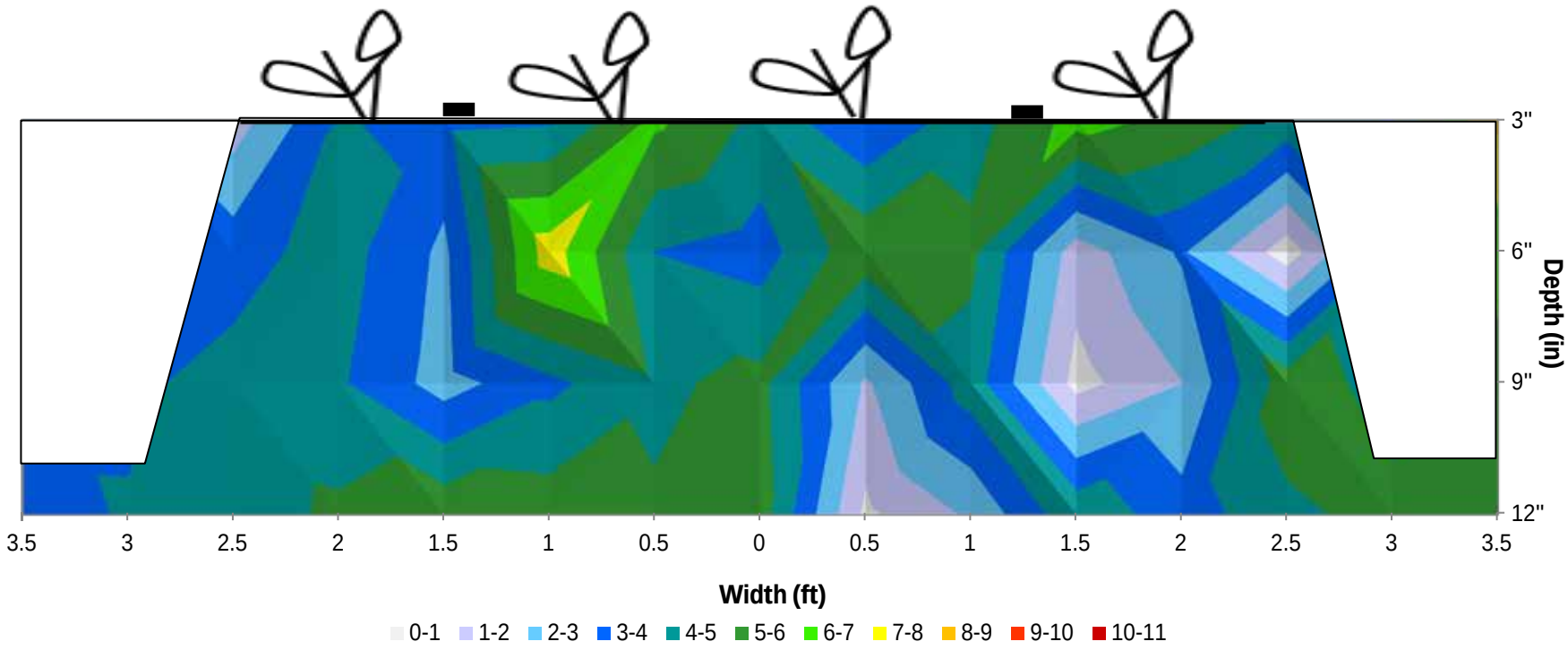
Manzanita Block 14A Reduced Sprinkler - 2 Tape
EC (dS/m) 4/17/12

Average EC 4.02 dS/m



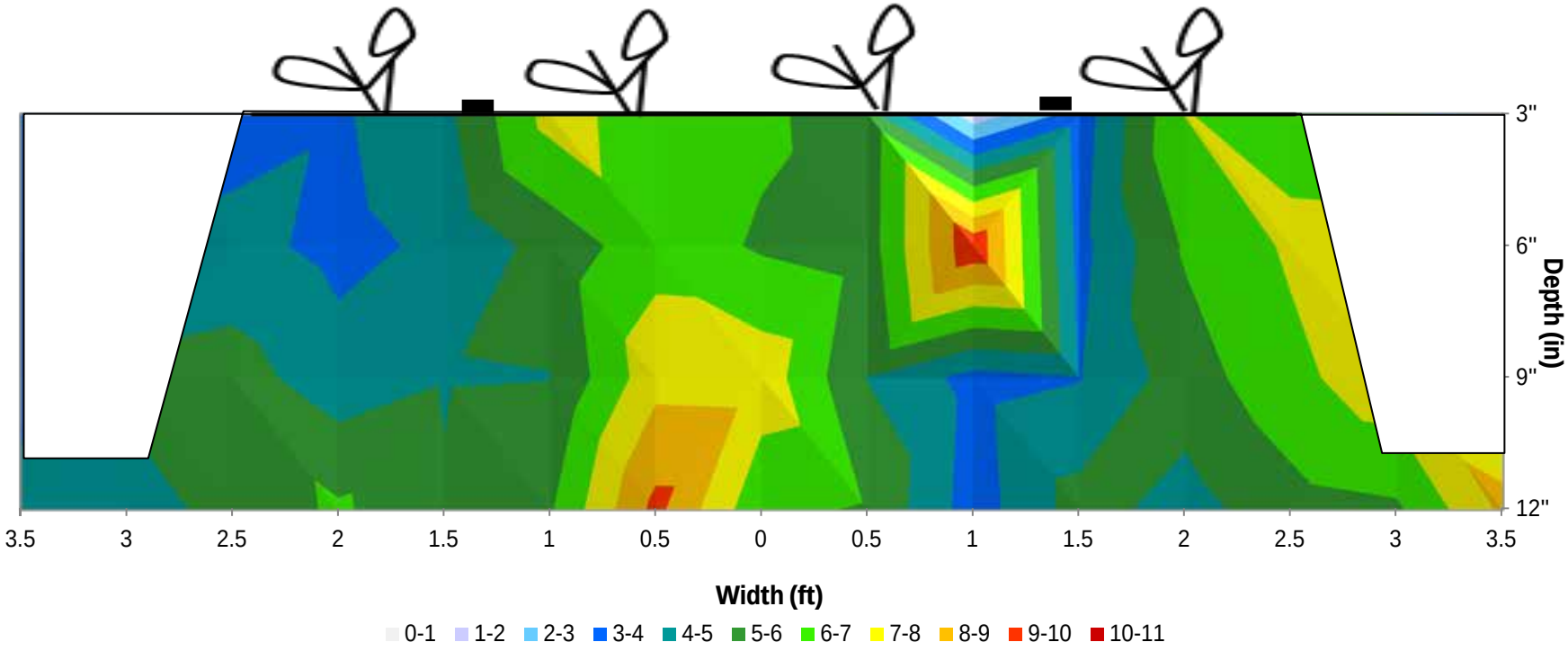
Manzanita Block 14 A Reduced Sprinkler - 2 Tape
EC (dS/m) 5/7/12

Average EC 4.15 dS/m



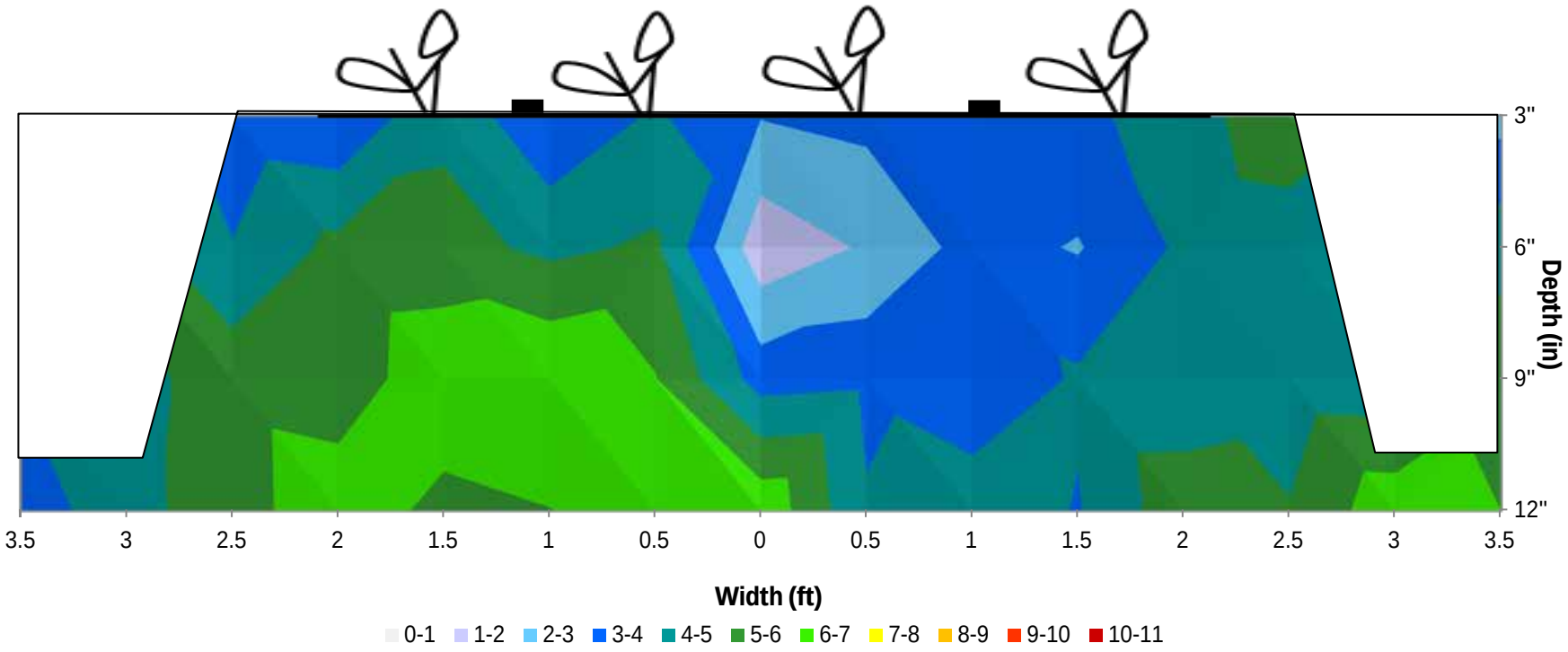
Manzanita Block 14 B Conventional - 2 Tape
EC (dS/m) 2/16/12

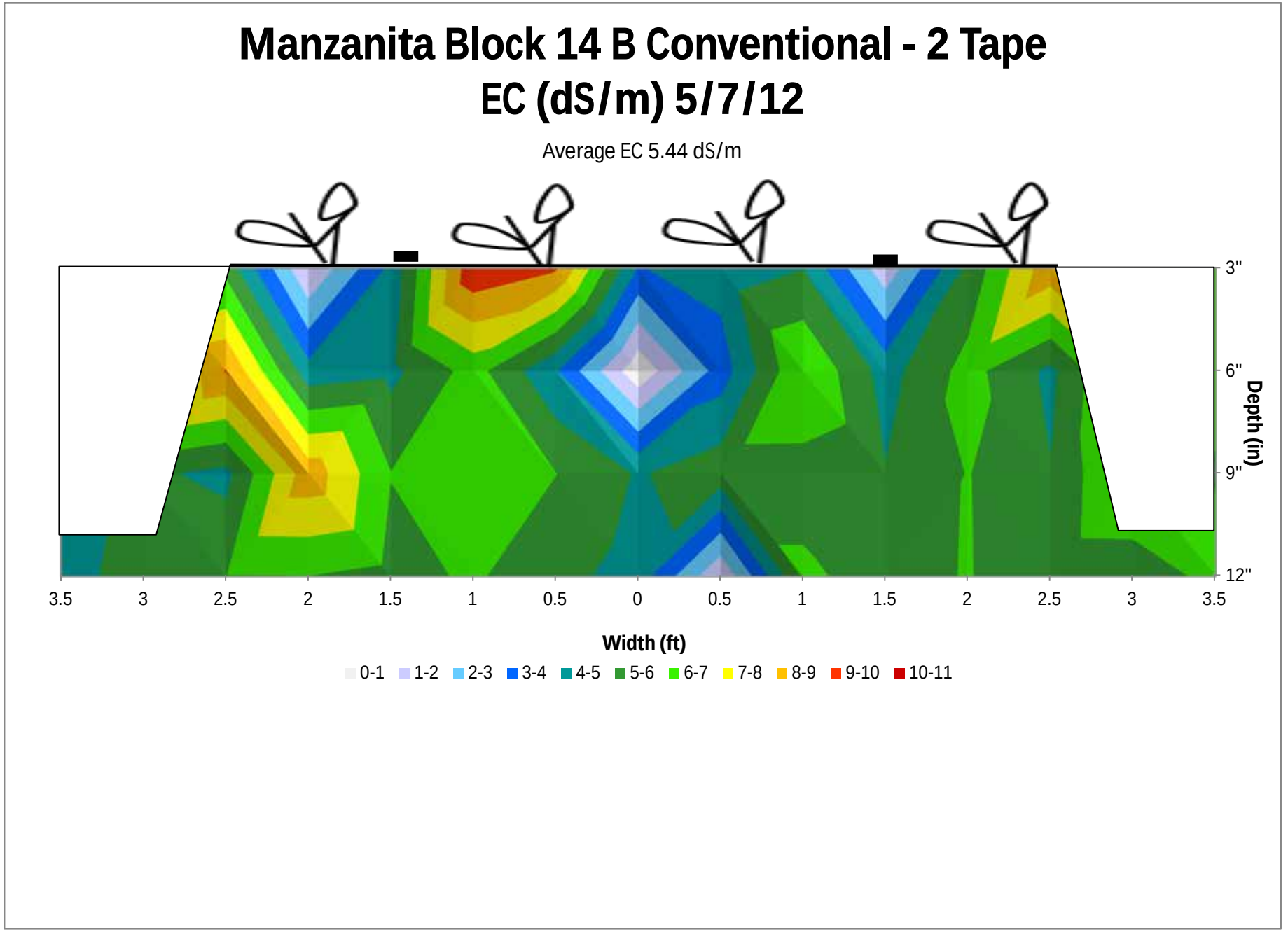
Average EC 5.84 dS/m



Manzanita Block 14B Conventional - 2 Tape
EC (dS/m) 4/17/12

Average EC 4.45 dS/m




Manzanita Block 14 B Conventional - 2 Tape
EC (dS/m) 5/7/12
Average EC 5.44 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
3.5
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11

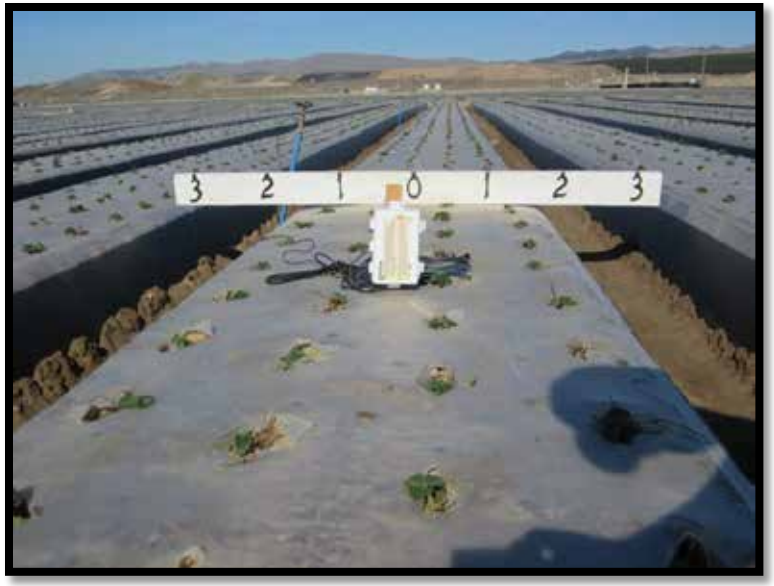
Gracia

Gracia - Block A

Reduced Sprinkler

11/11/11 – 1 DAP

12/6/11 – 26 DAP



1/12/12 – 63 DAP

2/10/12 – 92 DAP

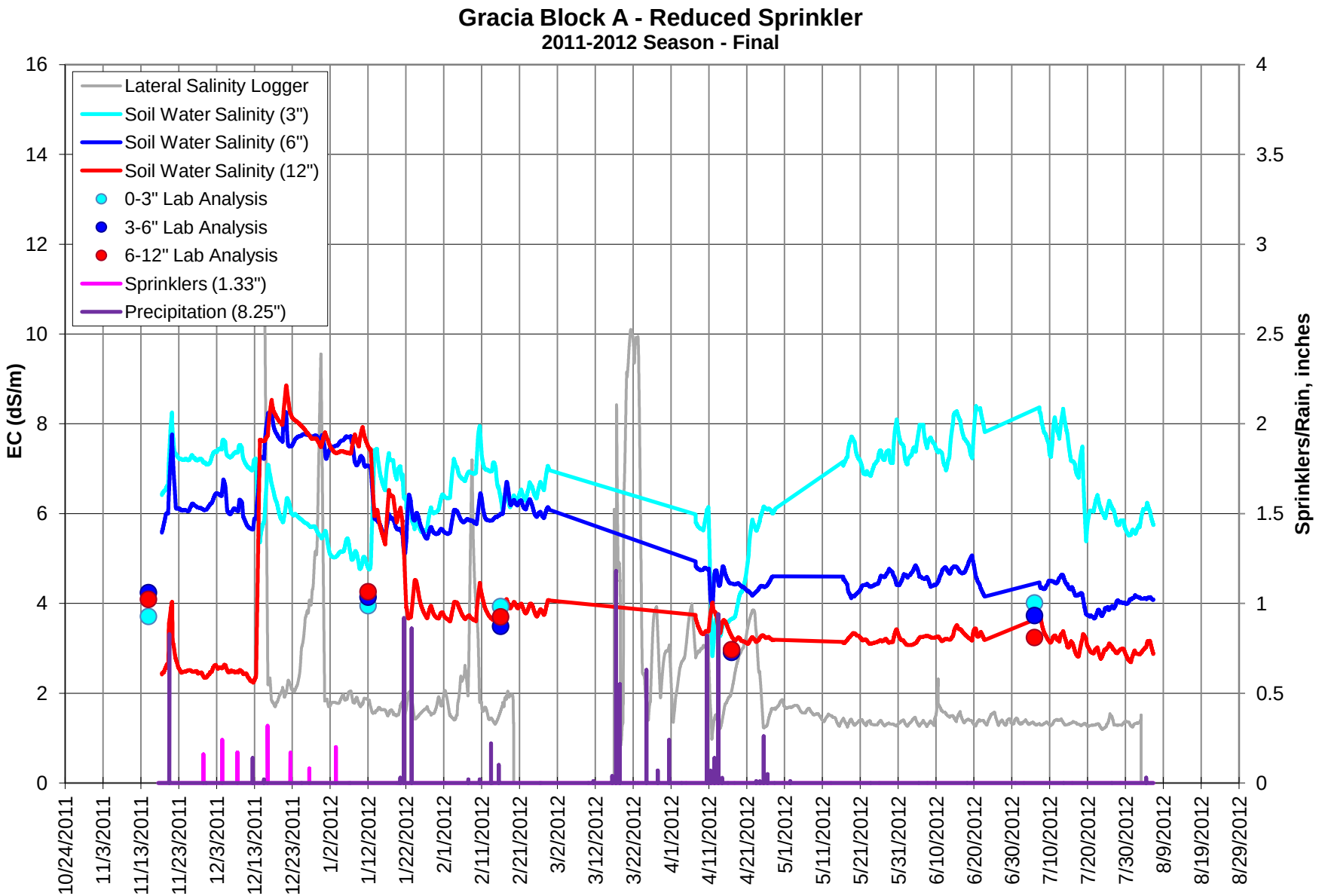
Gracia - Block A

Reduced Sprinkler

4/6/12 – 148 DAP

5/15/12 – 187 DAP

7/6/12 – 239 DAP


Gracia Block A - Reduced Sprinkler
2011-2012 Season - Final
Lateral Salinity Logger
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (1.33")
Precipitation (8.25")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
10/24/2011
11/3/2011
11/13/2011
11/23/2011
12/3/2011
12/13/2011
12/23/2011
1/2/2012
1/12/2012
1/22/2012
2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012
7/20/2012
7/30/2012
8/9/2012
8/19/2012
8/29/2012

Gracia - Block B

Conventional

11/11/11 – 1 DAP

12/6/11– 25 DAP

1/12/12– 62 DAP

2/10/12 – 92 DAP

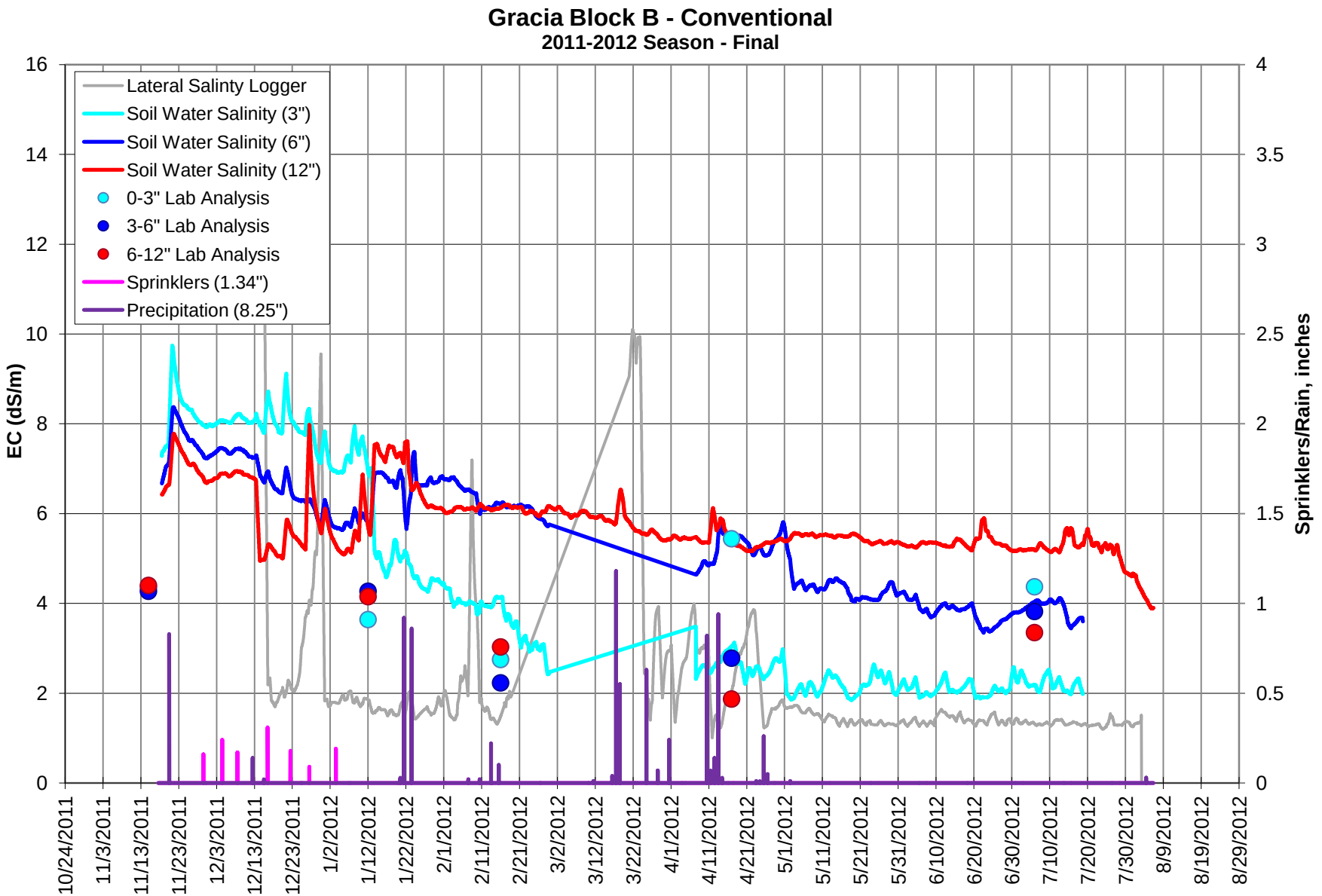
Gracia - Block B

Conventional

4/6/12 – 148 DAP

5/15/12– 187 DAP

7/6/12– 239 DAP


Gracia Block B - Conventional
2011-2012 Season - Final
Lateral Salinty Logger
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (1.34")
Precipitation (8.25")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
10/24/2011
11/3/2011
11/13/2011
11/23/2011
12/3/2011
12/13/2011
12/23/2011
1/2/2012
1/12/2012
1/22/2012
2/1/2012
2/11/2012
2/21/2012
3/2/2012
3/12/2012
3/22/2012
4/1/2012
4/11/2012
4/21/2012
5/1/2012
5/11/2012
5/21/2012
5/31/2012
6/10/2012
6/20/2012
6/30/2012
7/10/2012
7/20/2012
7/30/2012
8/9/2012
8/19/2012
8/29/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Gracia Blocks

ITRC Report No. R 12-005

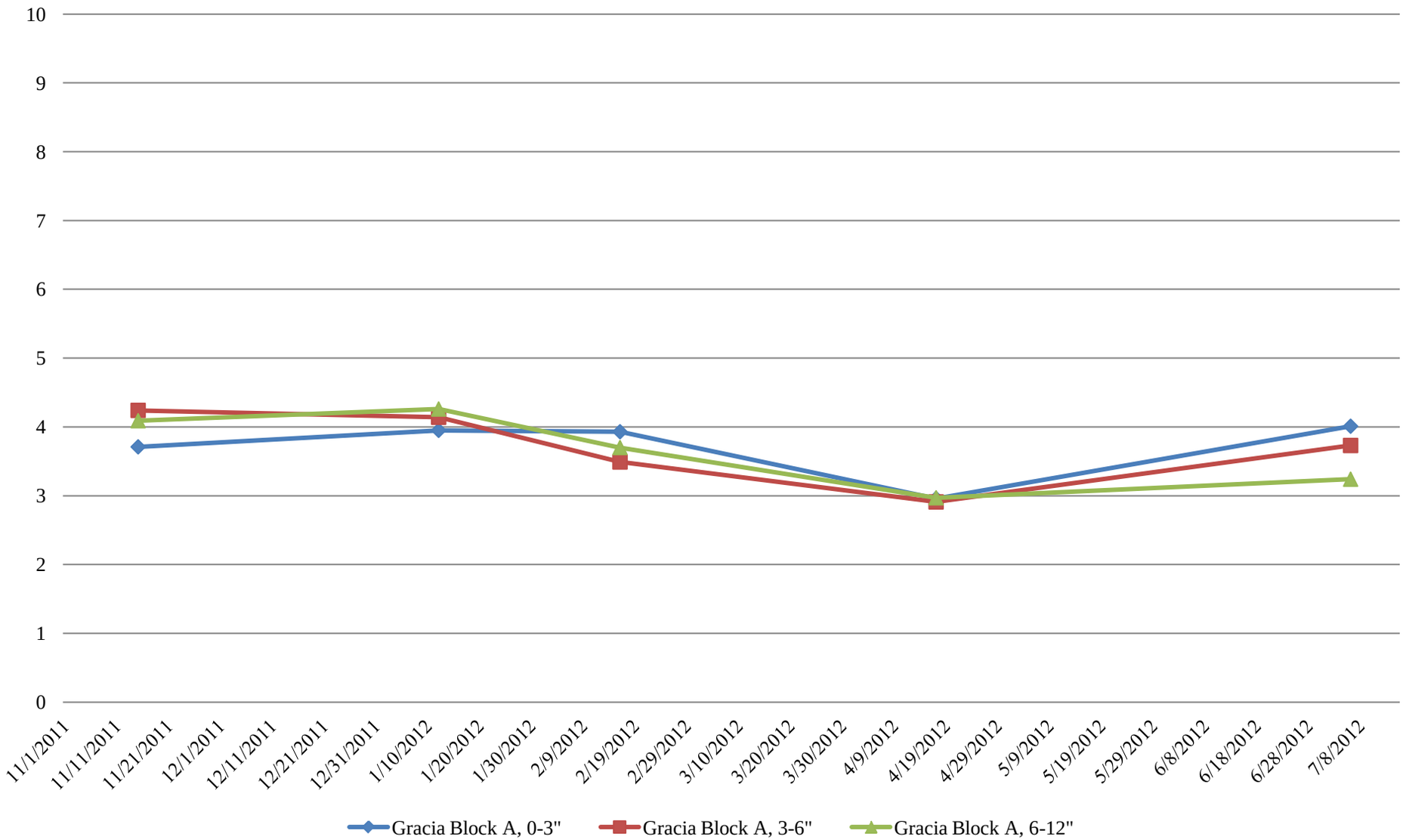
Date:		11/15/2011			1/12/2012			2/16/2012			4/17/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	3.71	50.75	DLS	3.95	46.55	DLS	3.93	29.40	DLS	2.96	18.20
	3-6"	DLS	4.24	43.40	DLS	4.14	49.35	DLS	3.49	16.10	DLS	2.91	7.70
	6-12"	DLS	4.09	44.10	DLS	4.26	57.05	DLS	3.70	42.35	DLS	2.97	7.70
Block B	0-3"	SSS	4.35	75.25	SSS	3.64	32.20	SSS	2.75	25.20	SSS	5.44	31.50
	3-6"	SSS	4.27	51.45	SSS	4.27	31.50	SSS	2.23	10.50	SSS	2.78	12.60
	6-12"	SSS	4.40	67.20	SSS	4.15	41.65	SSS	3.03	5.25	SSS	1.87	13.65

Date:		7/6/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	4.01	85.40
	3-6"	DLS	3.73	87.50
	6-12"	DLS	3.24	14.35
Block B	0-3"	SSS	4.37	94.50
	3-6"	SSS	3.82	64.05
	6-12"	SSS	3.35	36.75

Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

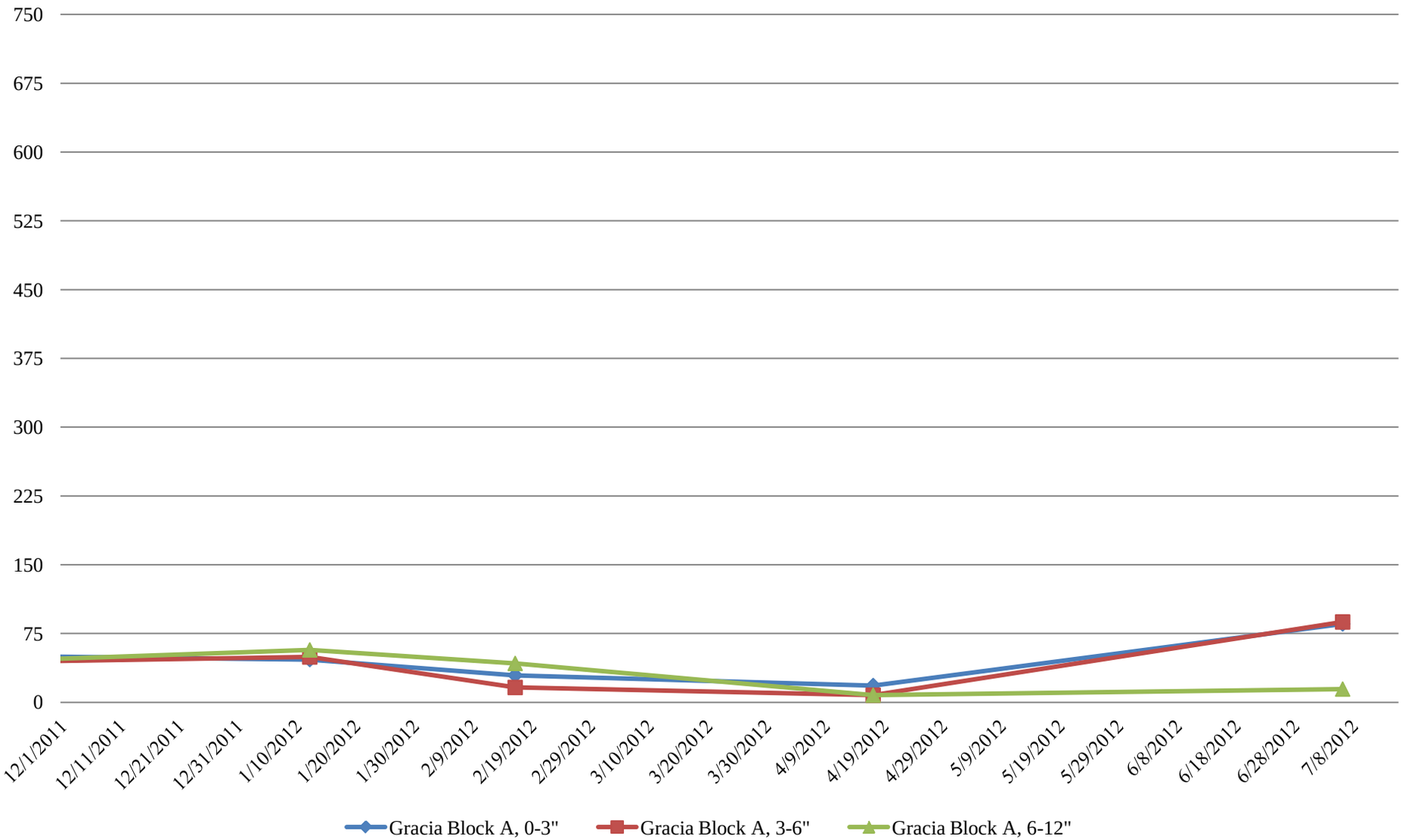
Gracia Block A

Salinity



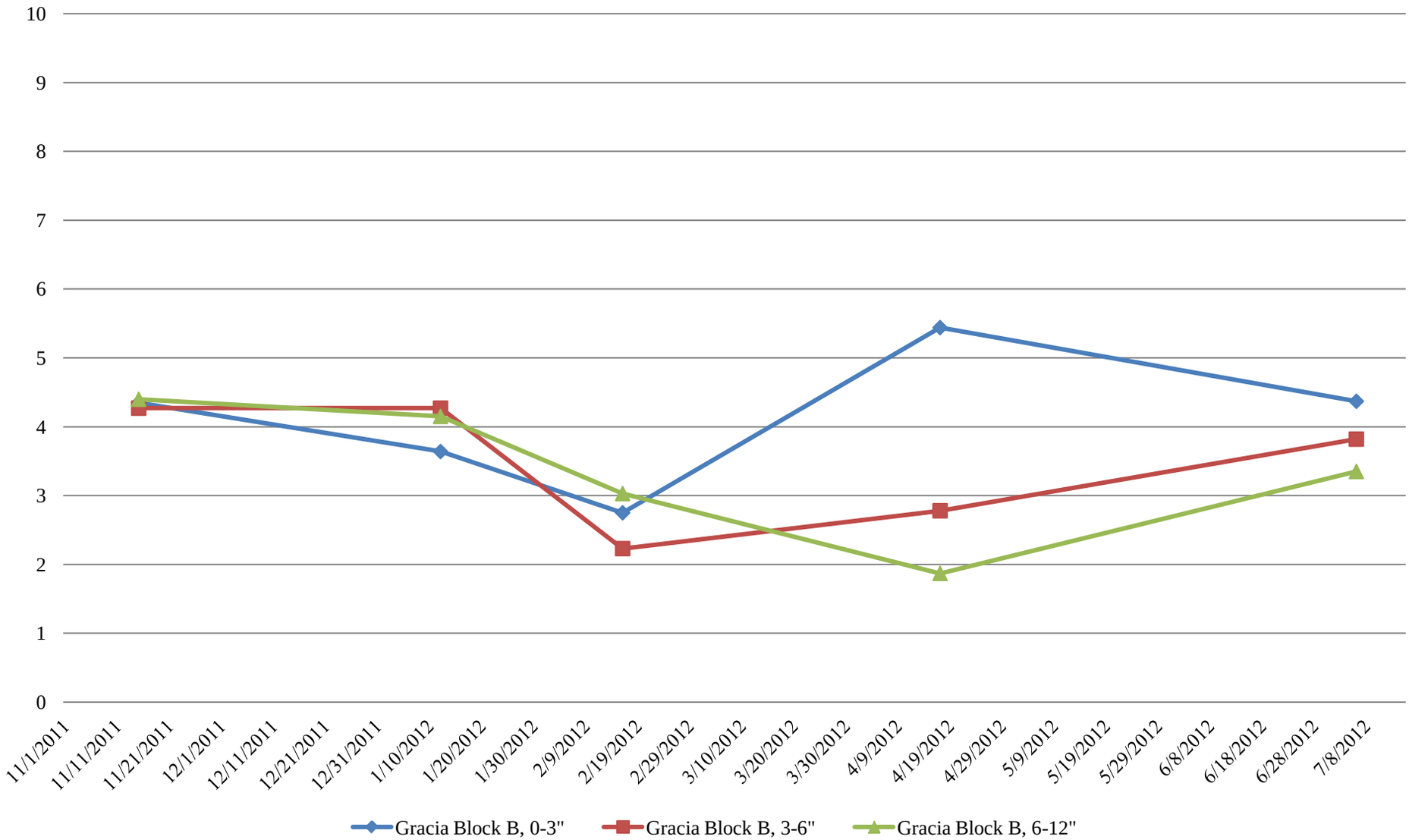
Gracia Block A

Chloride



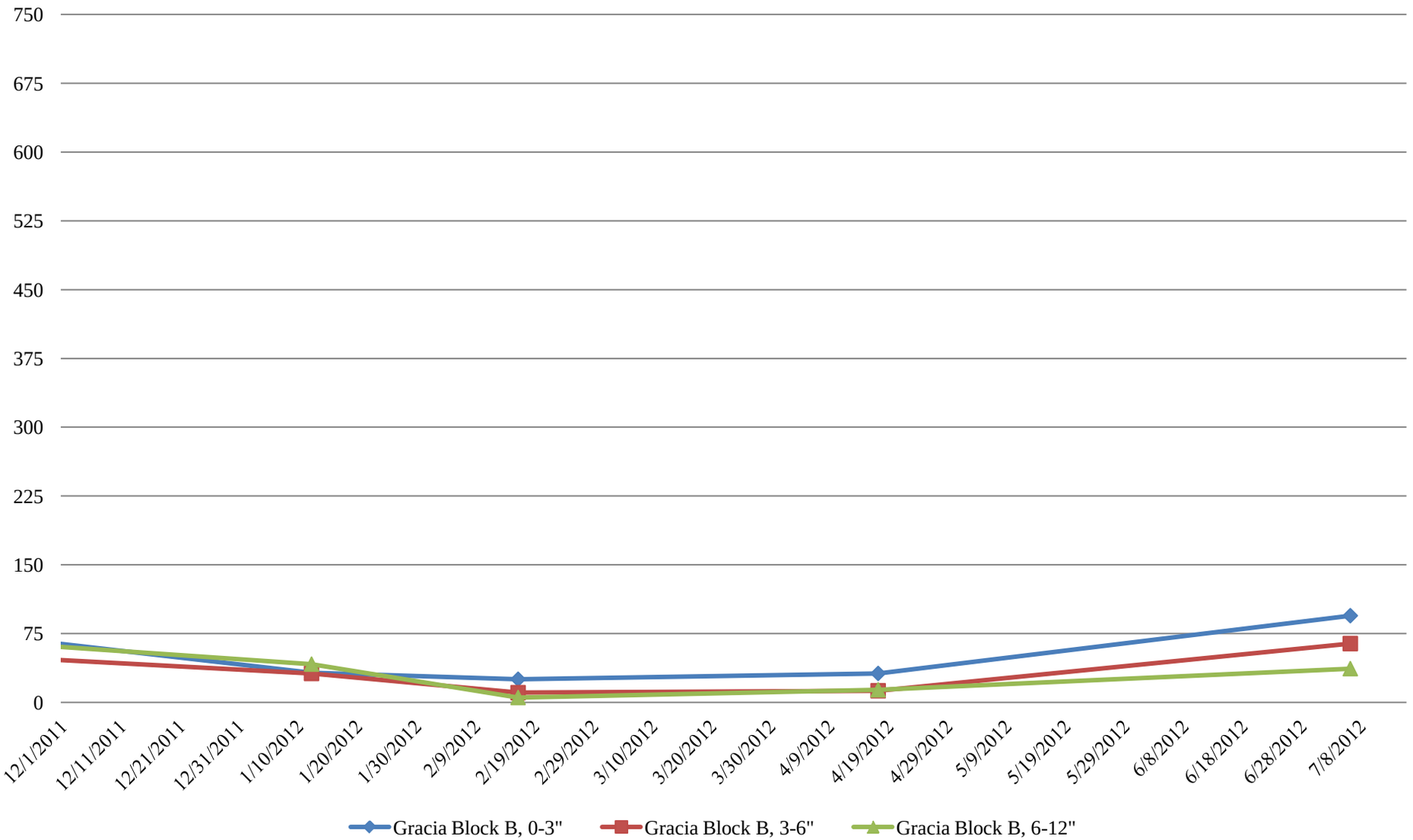
Gracia Block B

Salinity



Gracia Block B

Chloride

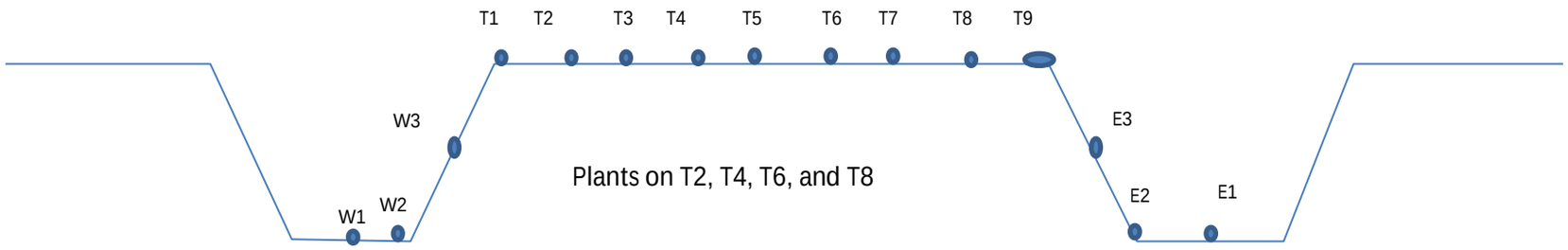


Salinity Data - Top 3 inches

Gracia Block A & B

Using 5TE Sensor and ProCheck

Salinity +8



Block A - 12 Jan. 2012

Gracia	West													East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	7.89	8.84	8.29	4.33	3.81	6.09	11.63	2.48	3.25	4.83	7.88	7.86	5.15	x
Temp (F)	x	55.2	55.9	57.4	58.8	58.8	58.8	58.3	58.3	58.5	58.6	58.3	58.1	57.9	x
% Moisture	x	16.7	17	16	17.5	18.9	16	13.9	16.8	21.2	20	16.1	17.7	15.3	x

Block B - 12 Jan. 2012

Gracia	West													East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	4.18	12.21	10.7	8.83	3.6	9.78	9.79	7.83	4.78	7.89	5.65	9.33	5.61	x
Temp (F)	x	57.6	58.6	59.9	60.6	60.4	59.7	59.4	59	58.6	58.6	58.63	58.5	58.5	x
% Moisture	x	16.3	16.7	15.7	17.9	22.7	16	15.1	17.9	20.9	15.7	16.2	16.4	17.5	x

Block A - 19 Jan. 2012

Gracia	West													East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	8.71	8.14	7.1	7.84	5.76	8.26	9.95	5.45	3.28	4.46	7.03	8.81	9.97	x
Temp (F)	x	61.9	62.8	63.3	62.6	61.6	61.5	61.3	61	61.3	61.3	61.5	60.8	61.5	x
% Moisture	x	15.5	15.4	15.6	18.6	20.8	17.2	15.6	15.3	12	19.4	15.8	16.4	14.2	x

Block B - 19 Jan. 2012

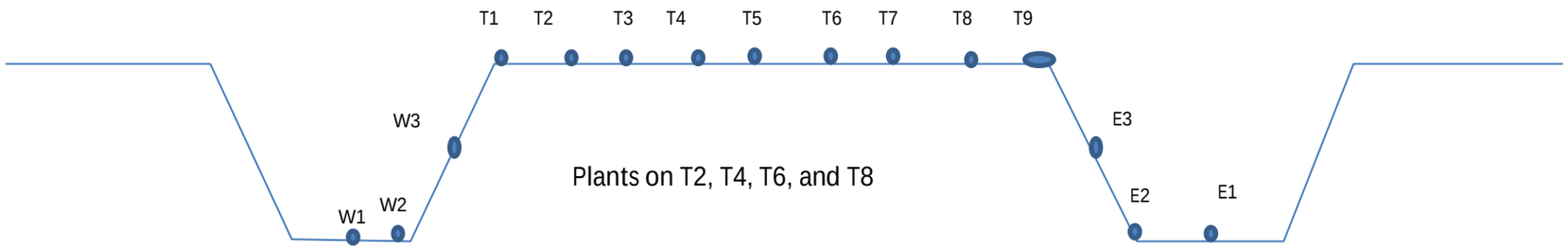
Gracia	West													East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	4.71	7.36	7.68	4.06	4.59	5.44	9.94	5.04	3.76	7.09	4.72	3.77	13.35	x
Temp (F)	x	60.4	60.8	62.8	63.3	62.4	62.4	63.5	64	63.7	63.5	63.3	61.9	63	x
% Moisture	x	16.4	16.1	12.1	19.2	22	18	13.9	16.1	21	19.2	14	15.4	14.4	x

Salinity Data - Top 3 inches

Gracia Block A & B

Using 5TE Sensor and ProCheck

Salinity +8



Block A - 8 Feb. 2012

Gracia	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	3.63	2.25	5.3	3.38	3.52	3	5.08	6.07	6.2	5.65	2.75	5.17	6.96	3.13	2.33
Temp (F)	81.5	78.3	77.9	79.5	78.8	78.1	77.2	76.8	77.2	77.2	76.1	75.4	75.2	74.7	73.9
% Moisture	16.4	17.4	17.4	14.5	18.8	15.5	17	13.1	17.2	11.6	18.9	16.6	16.4	16.9	12.4

Block B - 8 Feb. 2012

Gracia	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	2.21	3.7	7.01	3.94	2.69	3.56	3.04	3.56	5.91	3.36	4.2	6.62	5.84	4.84	6.98
Temp (F)	76.3	76.1	76.6	77.9	78.3	77.5	77.7	77.7	78.1	77.5	77.2	76.6	76.3	75.7	74.8
% Moisture	15.7	18	17.7	16.1	17.9	13	18.8	10.7	15.1	15.3	15.6	12.7	16.3	17.5	17.4

Block A - 6 April 2012

Gracia	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	1.4	6.6	4.16	1.99	3.99	4.19	8.04	6.23	3.79	3.9	6.64	5.08	2.69	x
Temp (F)	x	79	77.9	78.3	78.6	76.5	76.5	76.5	77.2	76.1	74.3	73.8	73.9	73.6	x
% Moisture	x	17.5	16.8	14.1	17.5	23.2	16.1	14.5	16.8	25.5	17.9	17.1	16.4	20.1	x

Block B - 6 April 2012

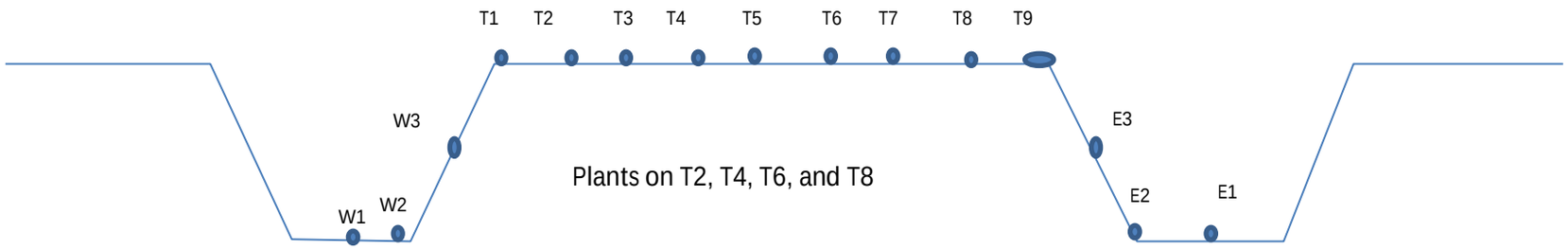
Gracia	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	3.68	2.6	6.02	3.83	1.54	2.45	14.11	3.3	7.71	6.58	8.22	15.97	3.53	x
Temp (F)	x	81.5	81.1	81.1	81.5	81.1	80.2	78.3	77	76.3	75.6	75	75.6	75.6	x
% Moisture	x	18.8	17.4	16	20.5	24.3	18.4	15.9	18.1	18.5	21.6	14	16.8	18.4	x

Salinity Data - Top 3 inches

Gracia Block A & B

Using 5TE Sensor and ProCheck

Salinity +8



Block A - 15 May 2012

Gracia	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	2.33	6.02	3.99	5.69	2.91	5.61	7.44	6.72	2.67	5.28	5.71	7.53	2.92	x
Temp (F)	x	83.5	81.7	80.8	80.6	80.4	79.9	78.8	77.7	77	76.1	77.7	80.4	81.1	x
% Moisture	x	18.1	16.1	14.9	17.2	23.8	15.5	16.6	16.2	23.9	18.2	7.6	18.4	20.1	x

Block B - 15 May 2012

Gracia	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	4.19	4.79	3.54	4.99	2.37	3.69	10.37	2.99	3.15	5.05	6.12	9.66	4.41	x
Temp (F)	x	84.6	83.5	82.8	81.7	79.5	79	78.1	77.2	76.6	75.9	76.6	79	79.9	x
% Moisture	x	18.7	17	18.3	17.2	26.2	16.8	18.2	16.8	24.3	18.1	16.8	18.4	19	x

Block A - 6 July 2012

Gracia	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	4.54	7.95	6.16	1.85	4.29	9.81	14.81	6.65	3.27	5.68	8.42	8.31	7.53	X
Temp (F)	X	59	599	60.4	60.8	61.3	61.7	62.6	63	63	63.1	63	63	63	X
% Moisture	X	16.8	16.2	14.7	17	19.3	20.1	18.4	17.3	23.1	18.3	16.4	16.5	18.4	X

Block B - 6 July 2012

Gracia	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	2.98	5.03	6.7	3.14	0.53	5.11	13.79	6.51	2.89	4.46	7.07	8.66	6.84	X
Temp (F)	X	64.2	64.4	64.8	64.9	64.9	64.9	65.1	64.8	65.3	65.1	64.9	65.3	65.3	X
% Moisture	X	16.3	17	16.5	19.6	14.4	17.4	19.3	18.9	20.2	18.2	17.4	18.1	16.1	X

Volumetric Data

Santa Maria Data

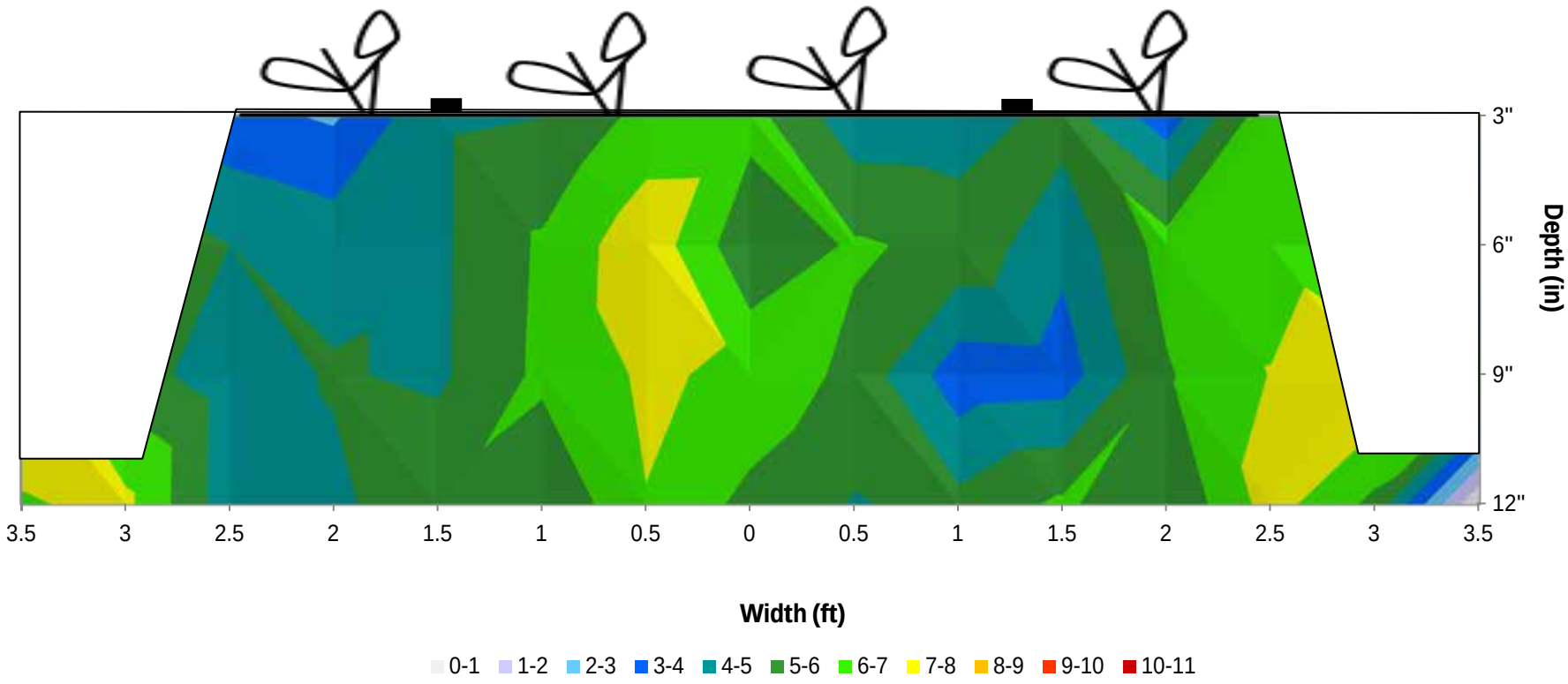
Gracia

Plant Date: 11/11/2011

		2 Tape	
	Date	A-Reduced Sprinkler	B-Conventional
Starting Meter Reading:	11/17/2011	0	0
Drip Meter Readings	12/6/2011	0.05	0.04
(Volume in AF)	1/12/2012	0.12	0.14
	2/8/2012	0.26	0.23
	4/6/2012	0.56	0.50
	5/15/2012	0.83	0.75
Volume (AF)	12/6/2011	0.05	0.04
(for the time period)	1/12/2012	0.07	0.10
*Reading - Previous Reading	2/8/2012	0.14	0.09
	4/6/2012	0.30	0.27
	5/15/2012	0.27	0.25
Area (AC)		0.84	0.90
Inches applied from drip (IN)	12/6/2011	0.71	0.53
Equation Used:	1/12/2012	1.71	1.87
=[Volume Used (AF) /	2/8/2012	3.71	3.07
Area(AC)]*(12 IN/FT)	4/6/2012	8.00	6.67
	5/15/2012	11.86	10.00
Sprinkler Estimates	12/6/2011	120	120
Minutes Operated (MIN)	1/12/2012	279.00	280.00
	2/8/2012	0.00	0.00
	4/6/2012	0.00	0.00
	5/15/2012	0.00	0.00
Total Sprinkler Inches (IN)	12/6/2011	0.40	0.40
	1/12/2012	1.33	1.34
	2/8/2012	1.33	1.34
	4/6/2012	1.33	1.34
	5/15/2012	1.33	1.34
Total Inches (IN)	12/6/2011	1.12	0.93
	1/12/2012	3.05	3.20
	2/8/2012	5.05	4.40
	4/6/2012	9.33	8.00
	5/15/2012	13.19	11.34

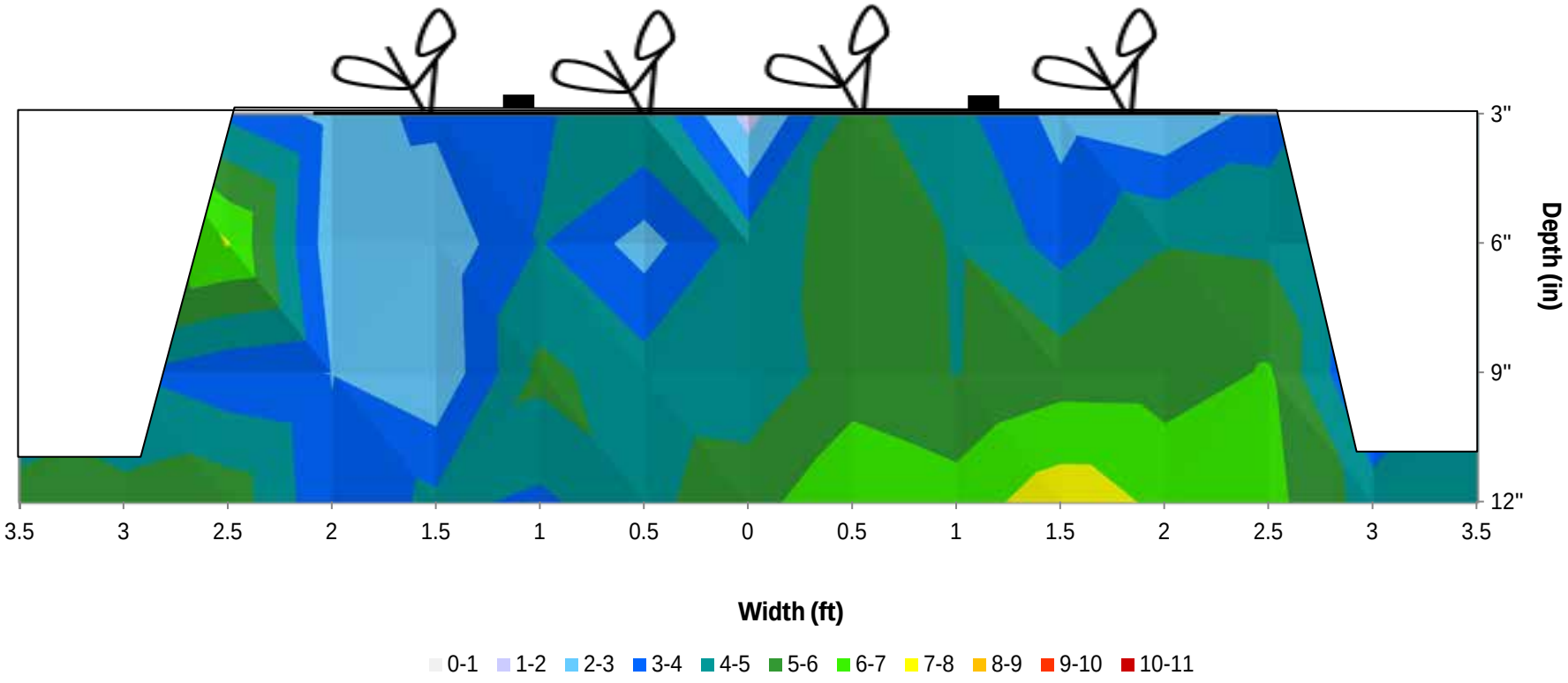
Gracia Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 2/16/12

Average EC 5.51 dS/m



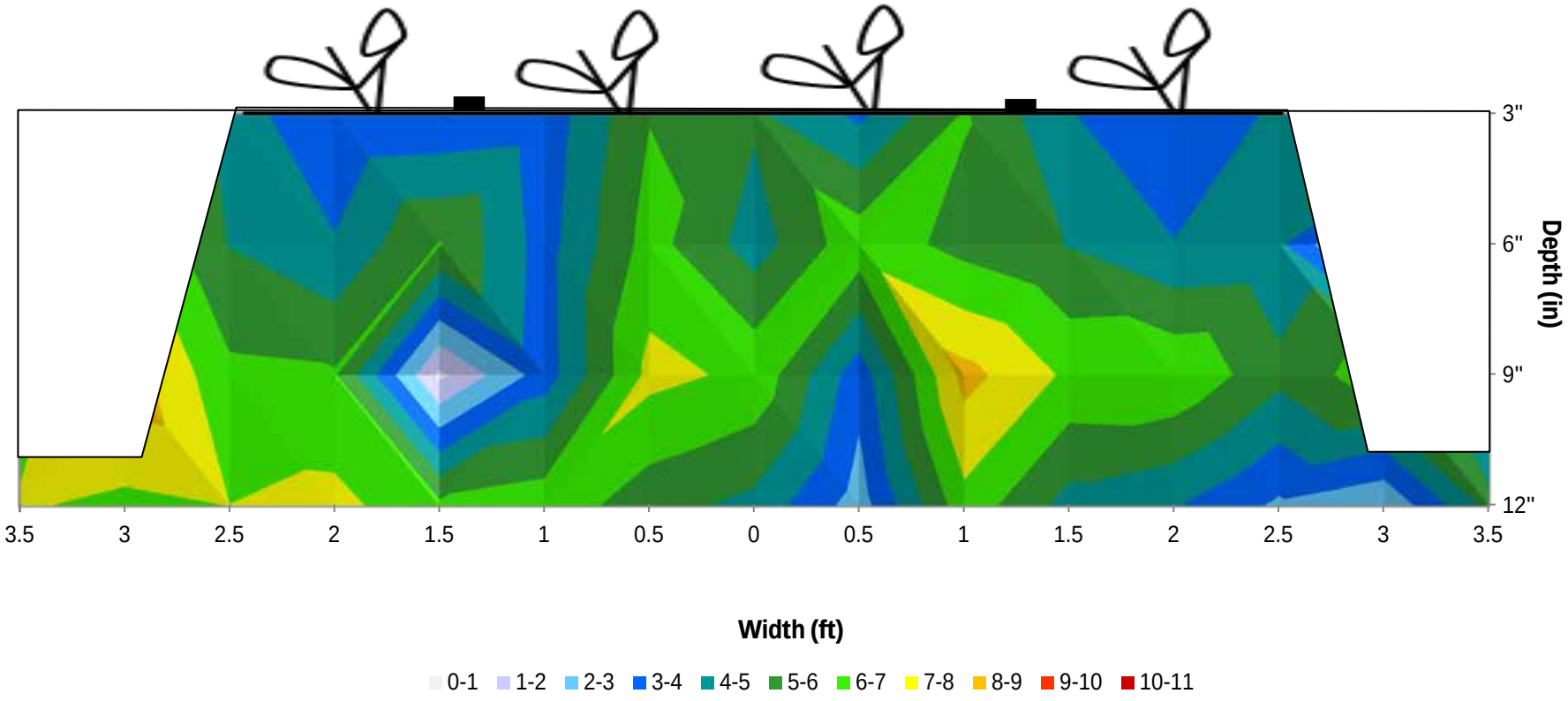
Gracia Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 4/17/12

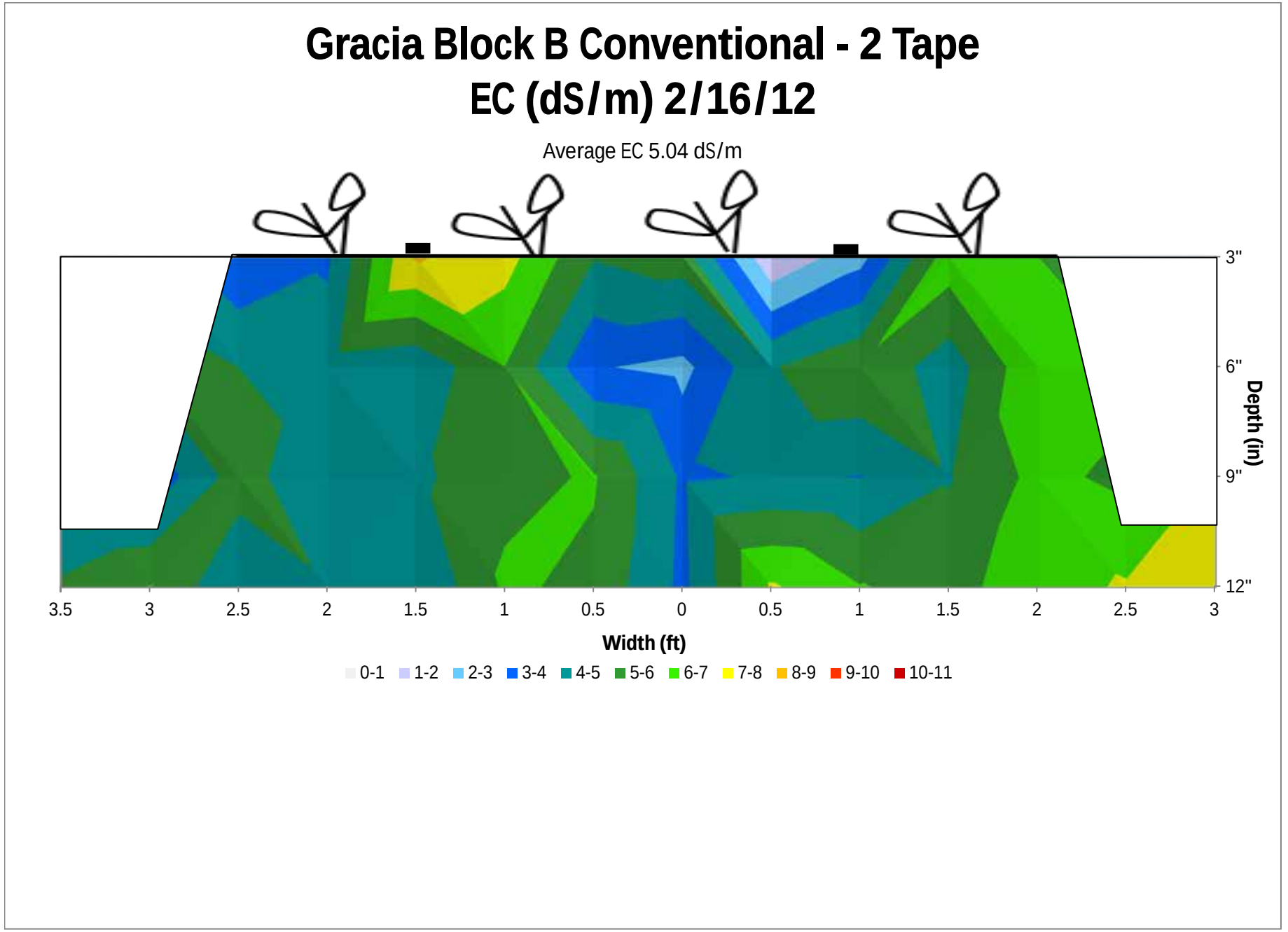
Average EC 4.52 dS/m

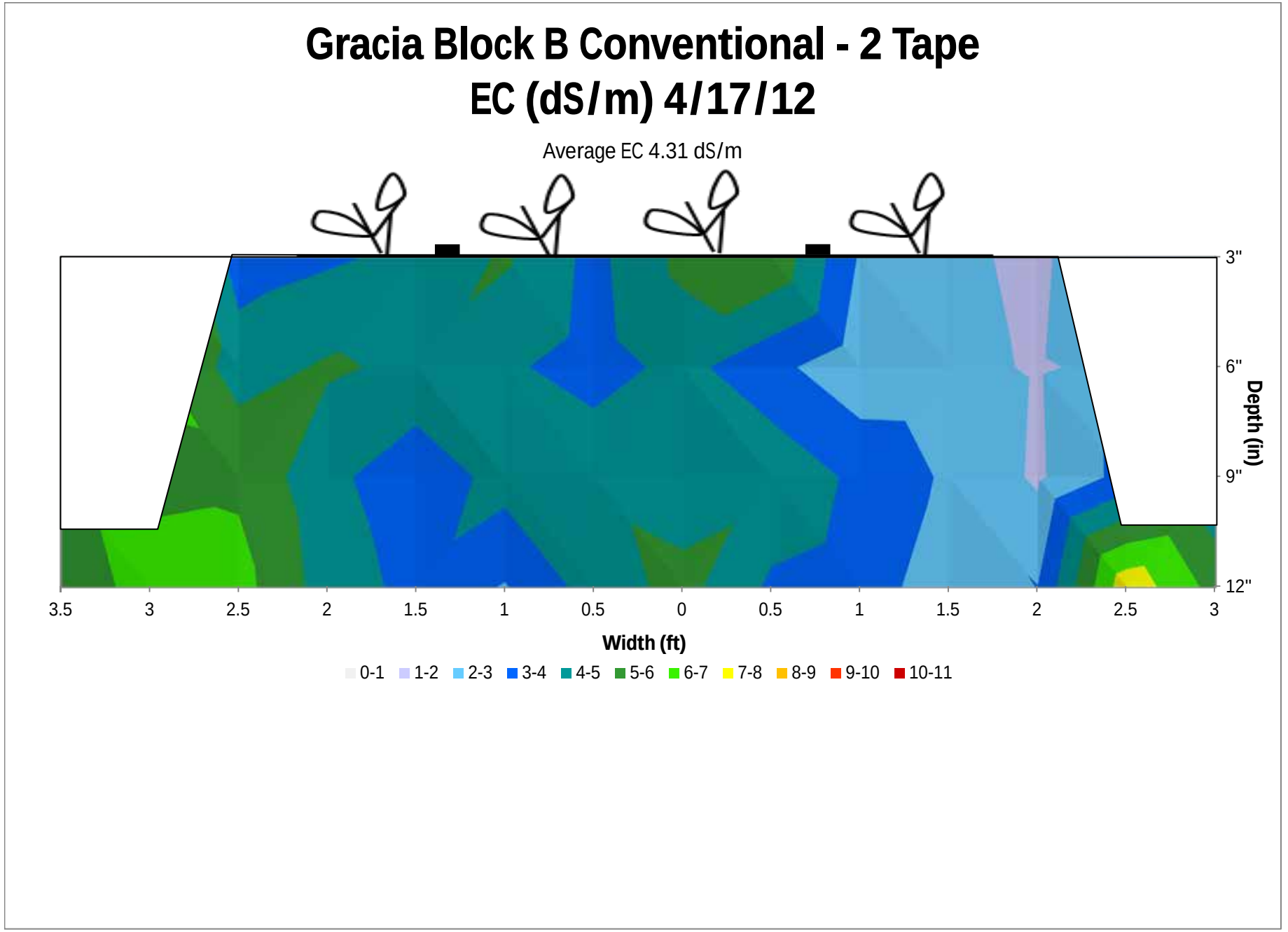


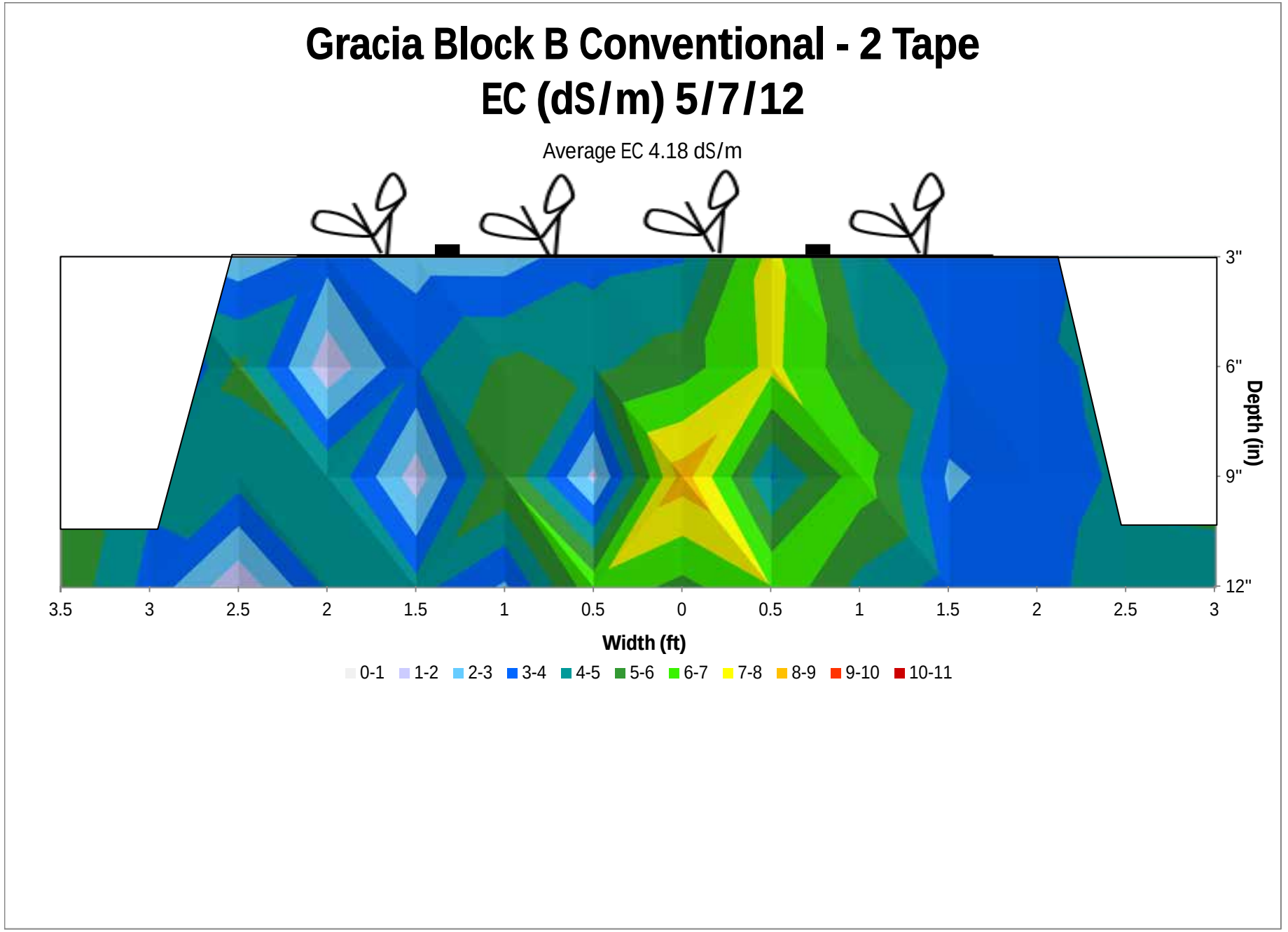
Gracia Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 5/7/12

Average EC 5.20 dS/m




Gracia Block B Conventional - 2 Tape
EC (dS/m) 2/16/12
Average EC 5.04 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11


Gracia Block B Conventional - 2 Tape
EC (dS/m) 4/17/12
Average EC 4.31 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11


Gracia Block B Conventional - 2 Tape
EC (dS/m) 5/7/12
Average EC 4.18 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11

Rice

Rice - Block A

Reduced Sprinkler

12/6/11 – 31 DAP

1/12/12– 68 DAP

2/15/12– 102 DAP

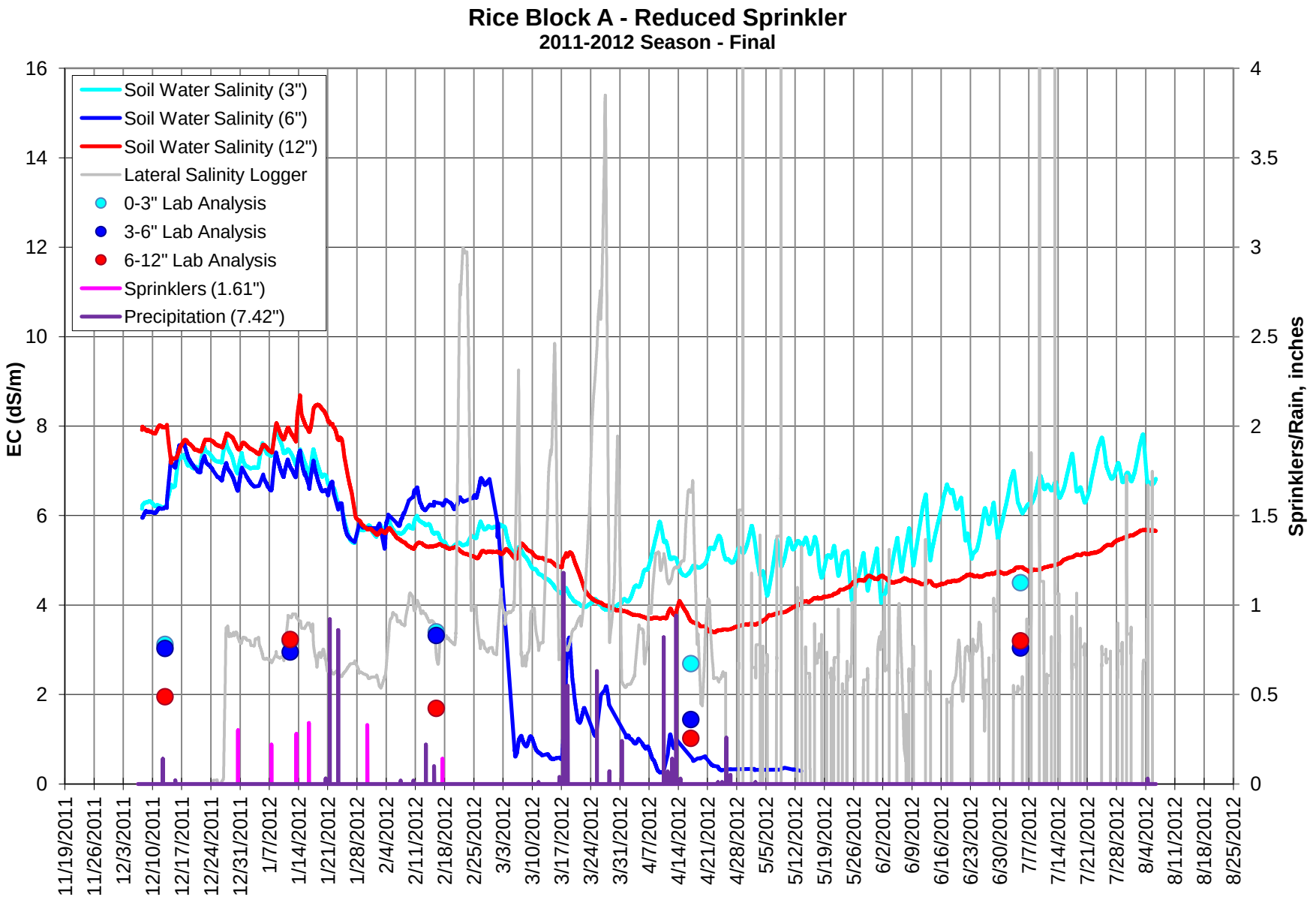
4/6/12– 160 DAP

Rice - Block A

Reduced Sprinkler

5/15/2012 – 199 DAP

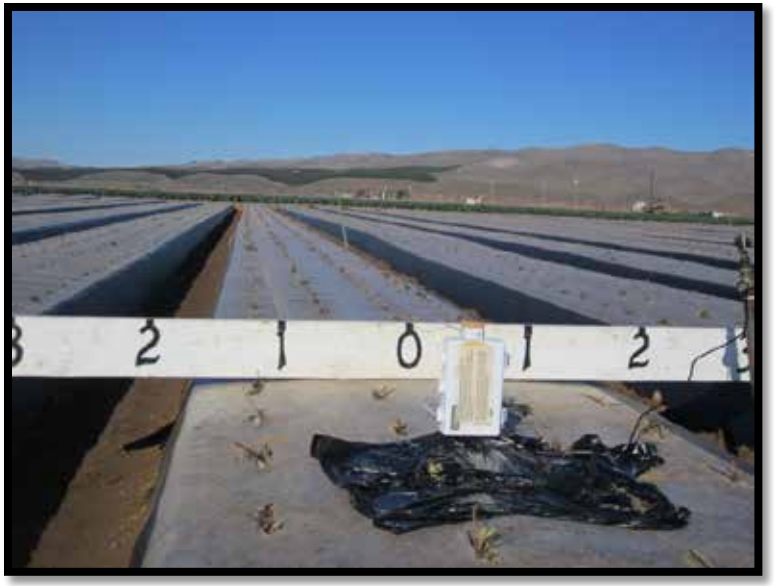
7/6/2012 – 251 DAP


Rice Block A - Reduced Sprinkler
2011-2012 Season - Final
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (1.61")
Precipitation (7.42")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
11/19/2011
11/26/2011
12/3/2011
12/10/2011
12/17/2011
12/24/2011
12/31/2011
1/7/2012
1/14/2012
1/21/2012
1/28/2012
2/4/2012
2/11/2012
2/18/2012
2/25/2012
3/3/2012
3/10/2012
3/17/2012
3/24/2012
3/31/2012
4/7/2012
4/14/2012
4/21/2012
4/28/2012
5/5/2012
5/12/2012
5/19/2012
5/26/2012
6/2/2012
6/9/2012
6/16/2012
6/23/2012
6/30/2012
7/7/2012
7/14/2012
7/21/2012
7/28/2012
8/4/2012
8/11/2012
8/18/2012
8/25/2012

Rice - Block B

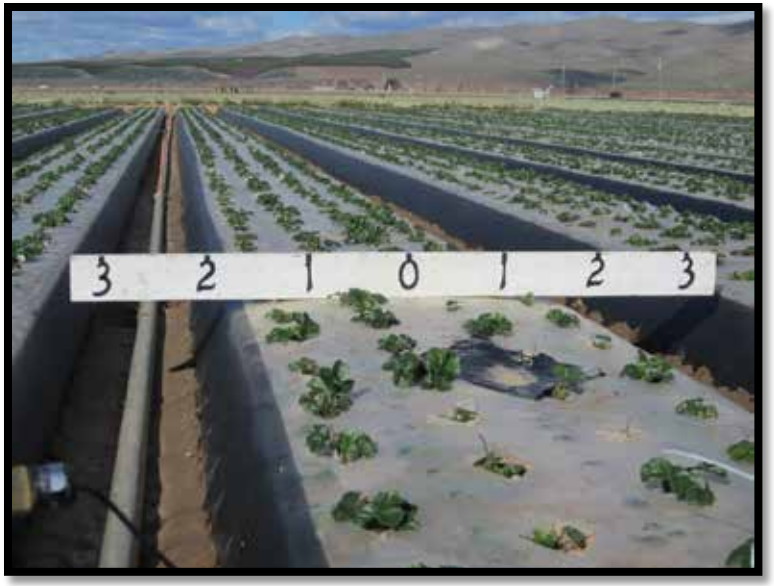
Conventional

12/6/11– 31 DAP



1/12/12– 68 DAP

2/15/12– 102 DAP



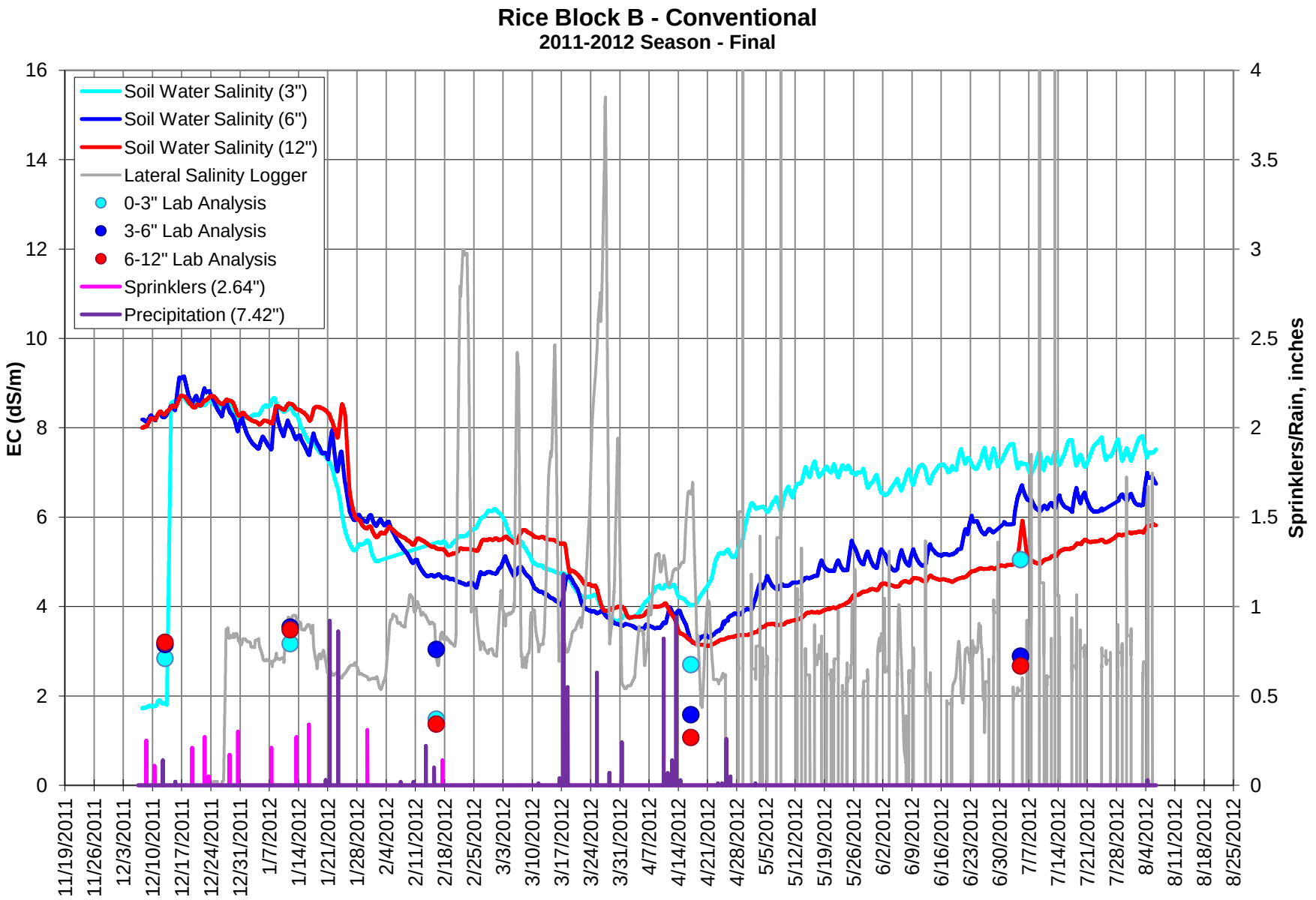
4/6/12– 160 DAP

Rice - Block B

Conventional

5/15/12– 199 DAP

7/6/12– 251 DAP


Rice Block B - Conventional
2011-2012 Season - Final
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (2.64")
Precipitation (7.42")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
11/19/2011
11/26/2011
12/3/2011
12/10/2011
12/17/2011
12/24/2011
12/31/2011
1/7/2012
1/14/2012
1/21/2012
1/28/2012
2/4/2012
2/11/2012
2/18/2012
2/25/2012
3/3/2012
3/10/2012
3/17/2012
3/24/2012
3/31/2012
4/7/2012
4/14/2012
4/21/2012
4/28/2012
5/5/2012
5/12/2012
5/19/2012
5/26/2012
6/2/2012
6/9/2012
6/16/2012
6/23/2012
6/30/2012
7/7/2012
7/14/2012
7/21/2012
7/28/2012
8/4/2012
8/11/2012
8/18/2012
8/25/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Rice Blocks

ITRC Report No. R 12-005

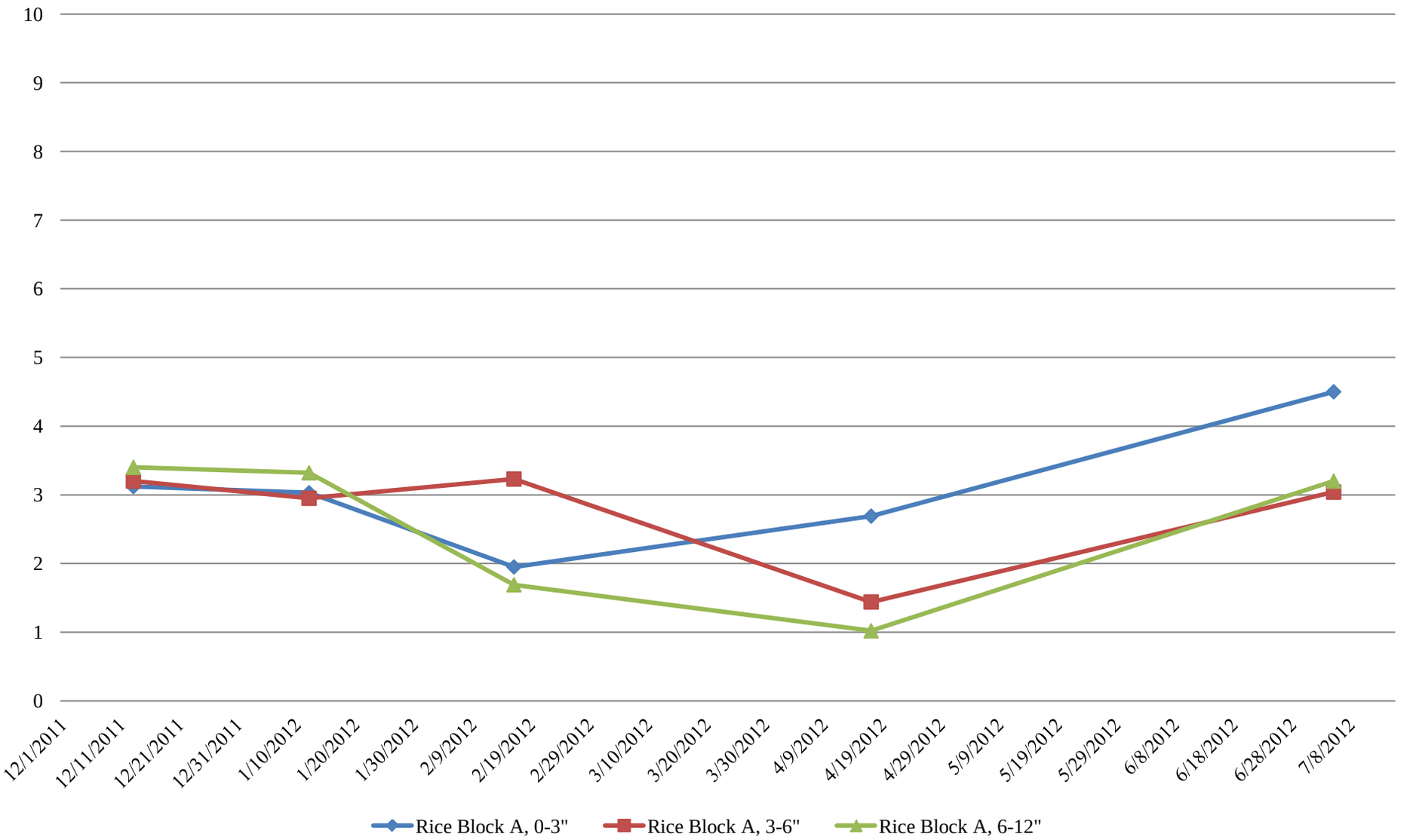
	Date:	12/13/2011			1/12/2012			2/16/2012			4/17/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	3.12	58.10	DLS	3.03	42.70	DLS	1.95	26.25	DLS	2.69	20.30
	3-6"	DLS	3.20	51.45	DLS	2.95	42.35	DLS	3.23	88.20	DLS	1.44	21.35
	6-12"	DLS	3.40	51.80	DLS	3.32	47.25	DLS	1.69	18.20	DLS	1.02	24.85
Block B	0-3"	SSS	2.84	54.60	SSS	3.17	57.75	SSS	1.48	15.40	SSS	2.70	22.40
	3-6"	SSS	3.15	51.80	SSS	3.54	46.90	SSS	3.04	19.95	SSS	1.58	24.50
	6-12"	SSS	3.20	58.10	SSS	3.48	53.90	SSS	1.37	13.65	SSS	1.07	24.15

	Date:	7/5/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	4.50	265.65
	3-6"	DLS	3.04	124.60
	6-12"	DLS	3.20	73.85
Block B	0-3"	SSS	5.05	289.80
	3-6"	SSS	2.89	128.80
	6-12"	SSS	2.67	89.25

Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

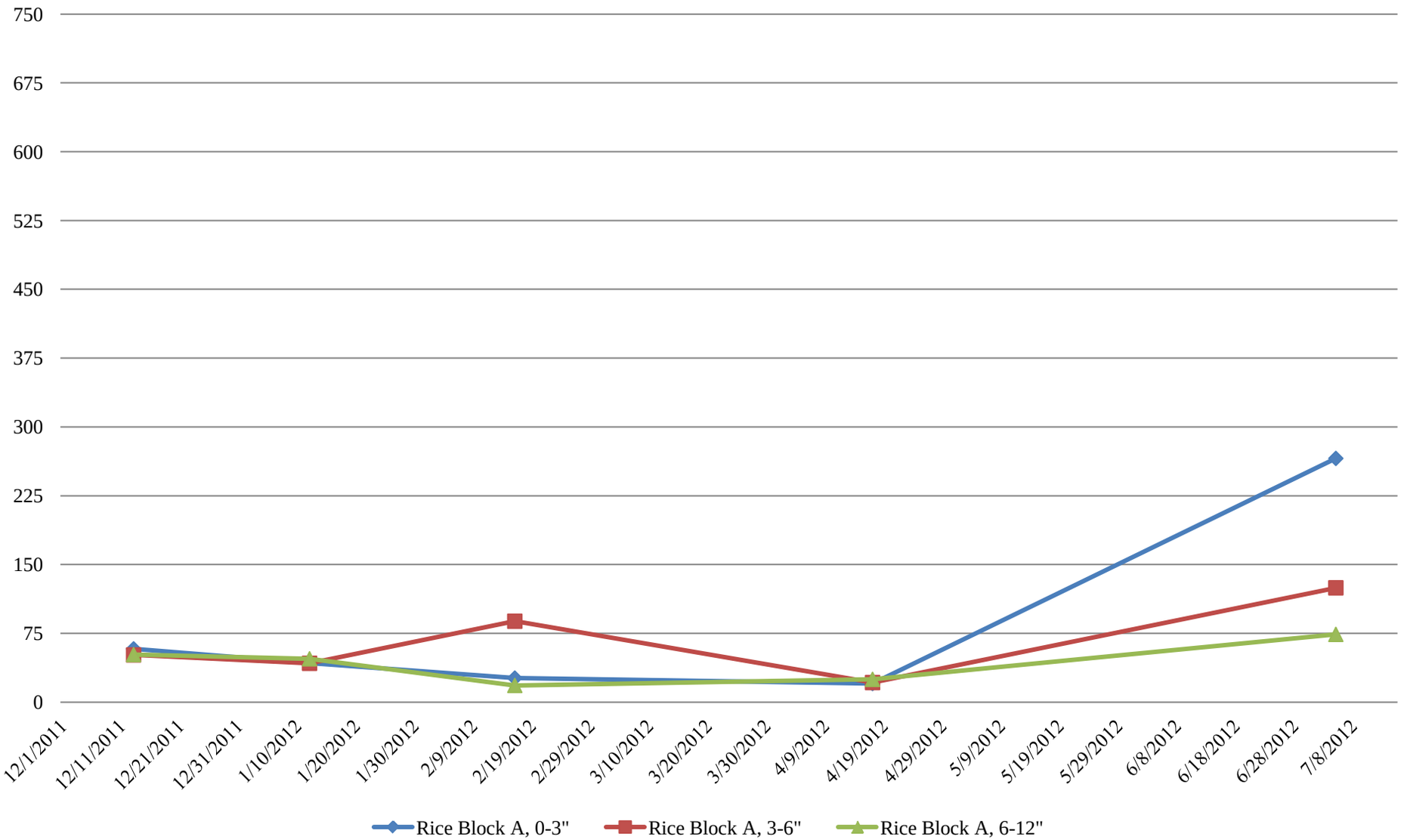
Rice Block A

Salinity



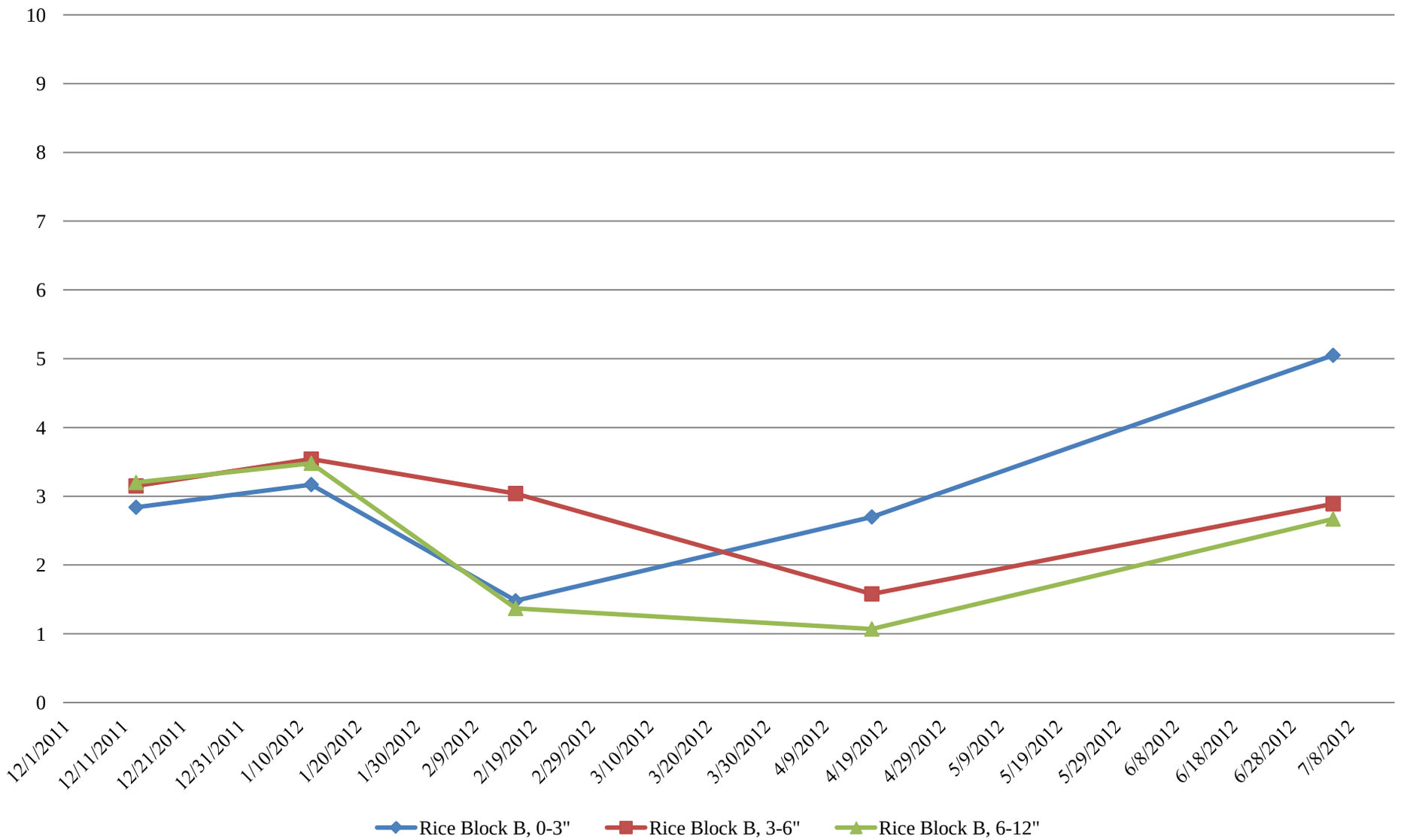
Rice Block A

Chloride



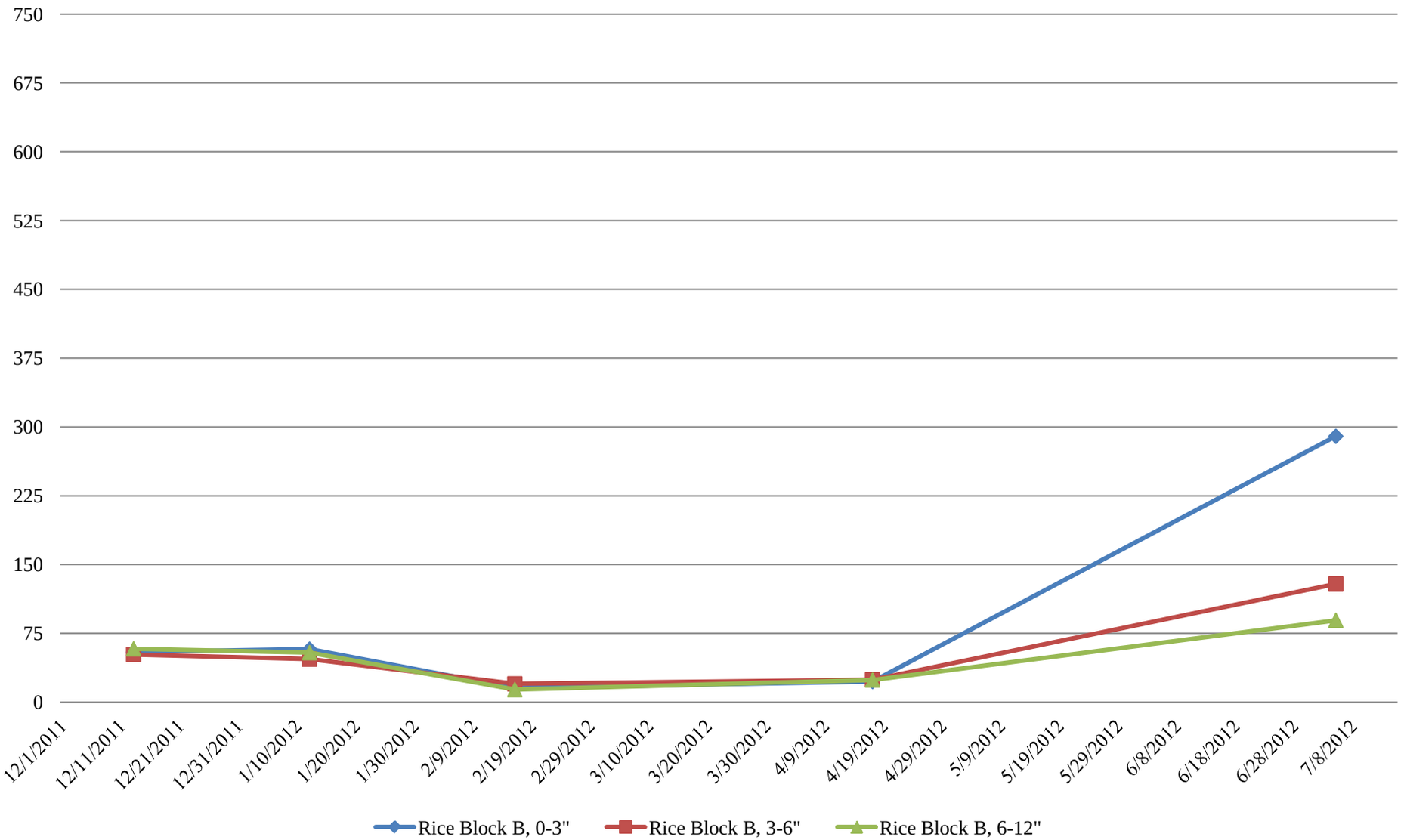
Rice Block B

Salinity



Rice Block B

Chloride

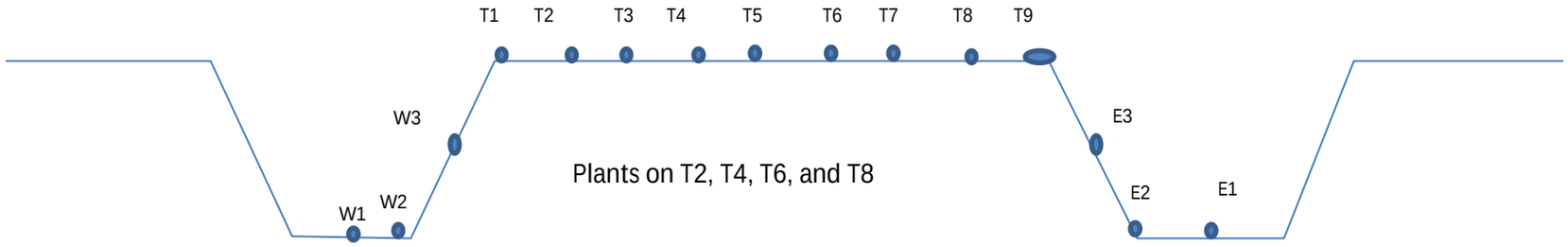


Salinity Data - Top 3 inches

Rice Block A & B

Using 5TE Sensor and ProCheck

Salinity +8



Block A - 12 Jan. 2012

Rice	West													East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	9.37	7.66	6.67	5.71	5.28	3.8	9.23	6.65	4.73	2.48	3.47	10.86	6.23	x
Temp (F)	x	58.6	59.5	61.9	63.9	63.5	62.6	62.1	61.3	61	61	61.8	60.6	59.9	x
% Moisture	x	21.5	20.4	18.4	17.2	17.6	17.8	16.5	18.9	21.3	17.4	19.2	17.3	19.1	x

Block B - 12 Jan. 2012

Rice	West													East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	6.1	9.73	4.35	7.2	2.98	5.52	8.29	6.1	4.6	5.5	4.2	9.03	10.82	x
Temp (F)	x	65.3	64.6	65.3	66	64.4	63.9	63.1	63	62.6	62.4	62.2	62.1	61.9	x
% Moisture	x	18.2	16.1	15.4	18.2	20.5	19	16.8	18.8	20.4	17.4	18.4	18.4	18.4	x

Block A - 19 Jan. 2012

Rice	West													East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	11.42	2.6	10.48	6.32	6.02	7.9	6.21	7.48	5.23	7.13	4.87	7.48	7.45	7.99	5.92
Temp (F)	62.1	61.3	61.9	63.1	63.3	61.9	61.7	62.1	62.1	61.9	61.7	61.9	61.9	61	59.5
% Moisture	17.4	15.2	15.1	12.8	15.1	13.6	17	15.3	15.1	12.8	14.9	13.6	13.3	15.6	20.7

Block B - 19 Jan. 2012

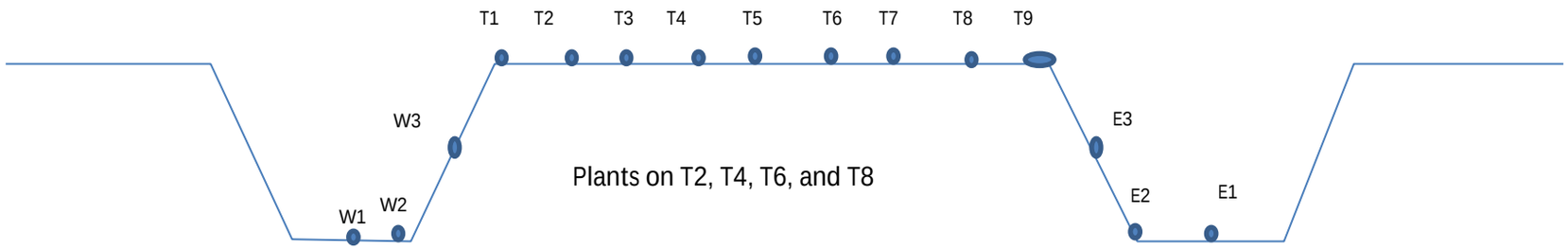
Rice	West													East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	5.45	4.77	8.75	5	5.16	6.15	4.82	9.22	7.53	10.63	4.18	4.81	11.85	9.15	7.63
Temp (F)	59.7	59.4	60.3	62.1	62.6	62.2	62.1	62.2	62.1	62.2	62.6	62.8	61.9	61	60.1
% Moisture	22.2	21.1	16.3	14.3	15.8	12.8	15.1	15.8	14.5	13.3	15.2	11.7	14.5	15.7	17.1

Salinity Data - Top 3 inches

Rice Block A & B

Using 5TE Sensor and ProCheck

Salinity +8



Block A - 15 Feb. 2012

Rice	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	3.62	2.88	8.86	2.52	2.35	4.4	4.42	6.4	7.65	7.29	3.45	6	10.29	3.37	4.69
Temp (F)	60.6	60.1	61	61.5	61.3	61.7	61.9	62.4	63.3	62.2	61.9	62.4	62.2	61.9	61
% Moisture	20.5	20.7	18.1	14.9	19.8	21.8	21.2	18.5	20.4	19.5	21	16	17	20.2	22.7

Block B - 15 Feb. 2012

Rice	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	5.53	2.57	5.87	3.28	4.8	4.46	2.81	9.72	3.5	4.38	4.88	1.91	4.49	4.5	7.62
Temp (F)	65.7	66.6	66.9	68.9	68.5	66.6	65.7	65.8	65.3	65.1	65.5	65.1	63.9	63	62.1
% Moisture	21.8	21.4	18.8	16.6	23.6	25.5	18.3	12.1	19.9	26.8	18.4	17.6	20.1	19	21.6

Block A - 6 April 2012

Rice	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	1.44	4.81	6.95	4.24	4.49	3.63	4.56	3.98	3.42	4.03	5.54	3.85	6.76	x
Temp (F)	x	85.1	84.6	84.4	84.6	83.7	83.7	82.4	82.8	80.2	79.2	79	79.2	79.5	x
% Moisture	x	18.4	16	13.6	16.3	17.8	19.3	17.8	14.5	16.4	17.8	16.6	17.3	19.6	x

Block B - 6 April 2012

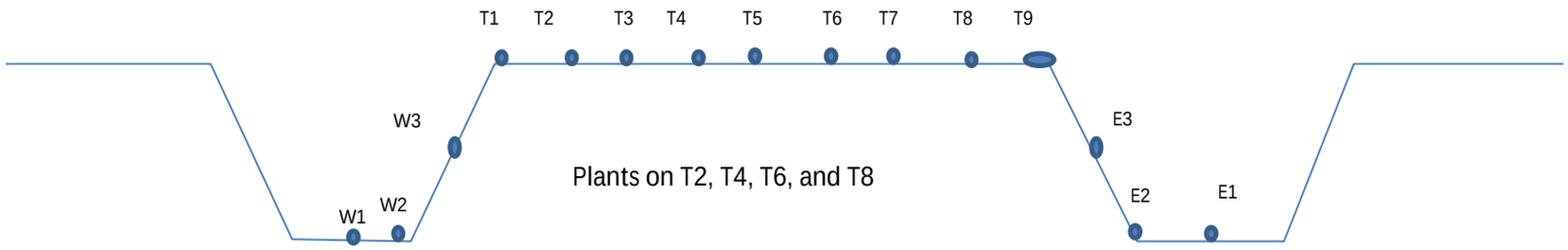
Rice	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	1.94	5.92	6.35	3.94	3.38	4	11.64	4.82	4.23	4.78	5.7	6.81	5.08	x
Temp (F)	x	84.6	84.2	84.6	85.5	84.9	84.7	83.7	83.1	81.5	81.3	80.6	80.4	80.2	x
% Moisture	x	18.6	15.3	11.9	16.3	15.9	16.8	11.5	13.6	16.3	19.7	11.1	18	18.3	x

Salinity Data - Top 3 inches

Rice Block A & B

Using 5TE Sensor and ProCheck

Salinity +8



Block A - 15 May 2012

Rice	West													East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	1.91	3.27	3.92	3.38	2.86	2.84	5.83	3.52	3.64	4.3	5.61	4.7	4.03	x
Temp (F)	x	90	87.6	86.9	85.8	83.7	82.2	81.7	81.7	80.6	80.1	80.6	82.9	84	x
% Moisture	x	19.6	13.4	15.5	19.6	17.8	17.4	16.6	18.8	20.6	19.7	19.3	17	18.7	x

Block B - 15 May 2012

Rice	West													East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	1.44	4.44	4.92	3.78	2.94	5.65	7.63	4.41	2.37	4.1	3.82	4.11	3.14	x
Temp (F)	x	93.2	91	90.5	90	87.6	85.5	84.3	83.5	81.5	81	82.2	86	87.1	x
% Moisture	x	21.1	17.7	13.9	20.4	21.4	20.2	20.6	20.2	18	19.5	21.6	17.9	19.6	x

Block A - 6 July 2012

Rice	West													East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	8.81	5.63	6.71	3.69	4.46	3.59	6.01	2.04	4.86	4.26	7.77	5.54	8.55	X
Temp (F)	X	70	70	70.2	70.3	70	70.2	70.2	70.3	70.2	70.2	70.2	71.2	71.8	X
% Moisture	X	21	19.5	19.8	20.7	18	21	20.3	17.9	19	19.8	18	18	18.9	X

Block B - 6 July 2012

Rice	West													East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	4.19	5.97	2.76	2.44	3.29	4.42	6.99	2.9	3.89	4.23	2.59	4.18	4.24	X
Temp (F)	X	87.1	85.8	84.9	84	82.4	81.5	80.8	80.4	79.5	79	78.6	79.2	80.2	X
% Moisture	X	22	20	20.2	19	19.3	21.3	19.1	22.8	19.2	22.1	22	20.7	24.6	X

Volumetric Data

Santa Maria Data

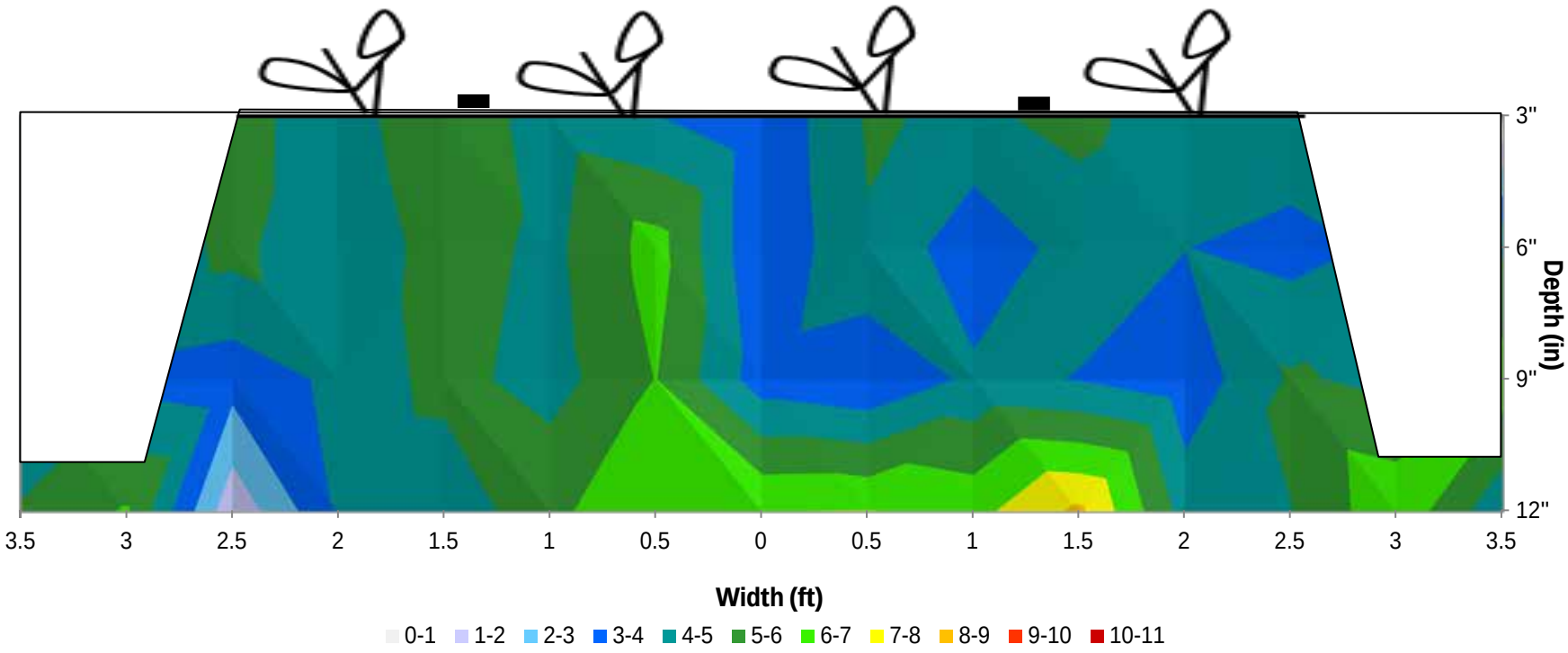
Rice

Plant Date: 11/5/2011

		2 Tape	
	Date	A-Reduced Sprinkler	B-Conventional
Starting Meter Reading:	11/17/2011	0	0
Drip Meter Readings	12/6/2011	0.02	0.01
(Volume in AF)	1/12/2012	0.09	0.06
	2/15/2012	0.17	0.10
	4/6/2012	0.32	0.21
	5/15/2012	0.52	0.34
Volume (AF)	12/6/2011	0.02	0.01
(for the time period)	1/12/2012	0.07	0.05
*Reading - Previous Reading	2/15/2012	0.08	0.04
	4/6/2012	0.15	0.11
	5/15/2012	0.20	0.13
Area (AC)		0.84	0.48
Inches applied from drip (IN)	12/6/2011	0.29	0.25
Equation Used:	1/12/2012	1.29	1.50
=[Volume Used (AF) /	2/15/2012	2.43	2.50
Area(AC)]*(12 IN/FT)	4/6/2012	4.57	5.25
	5/15/2012	7.43	8.50
Sprinkler Estimates	12/6/2011	0.00	75.00
Minutes Operated (MIN)	1/12/2012	154.00	395.00
	2/15/2012	284.00	277.00
	4/6/2012	0.00	0.00
	5/15/2012	0.00	0.00
Total Sprinkler Inches (IN)	12/6/2011	0.00	0.25
	1/12/2012	0.51	1.57
	2/15/2012	1.46	2.50
	4/6/2012	1.46	2.50
	5/15/2012	1.46	2.50
Total Inches (IN)	12/6/2011	0.29	0.50
	1/12/2012	1.80	3.07
	2/15/2012	3.89	5.00
	4/6/2012	6.04	7.75
	5/15/2012	8.89	11.00

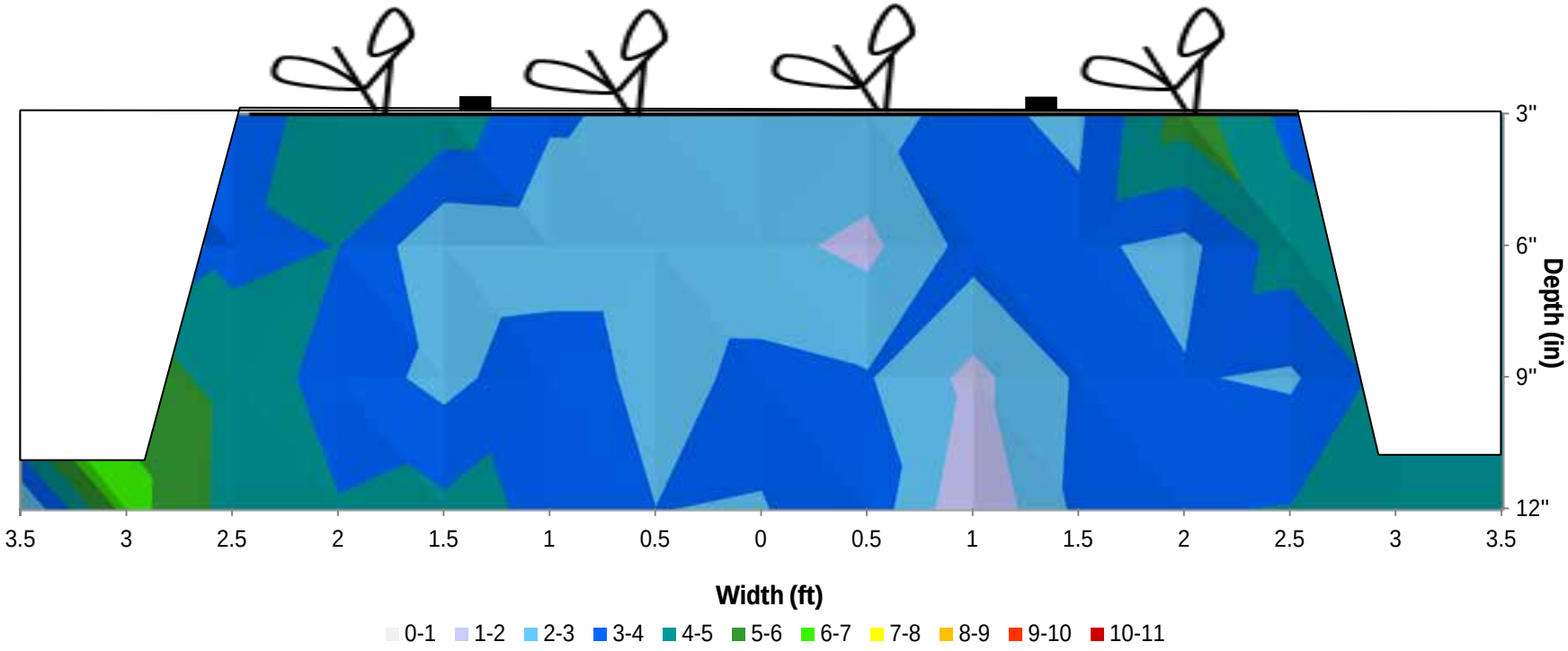
Rice Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 2/16/12

Average EC 5.71 dS/m



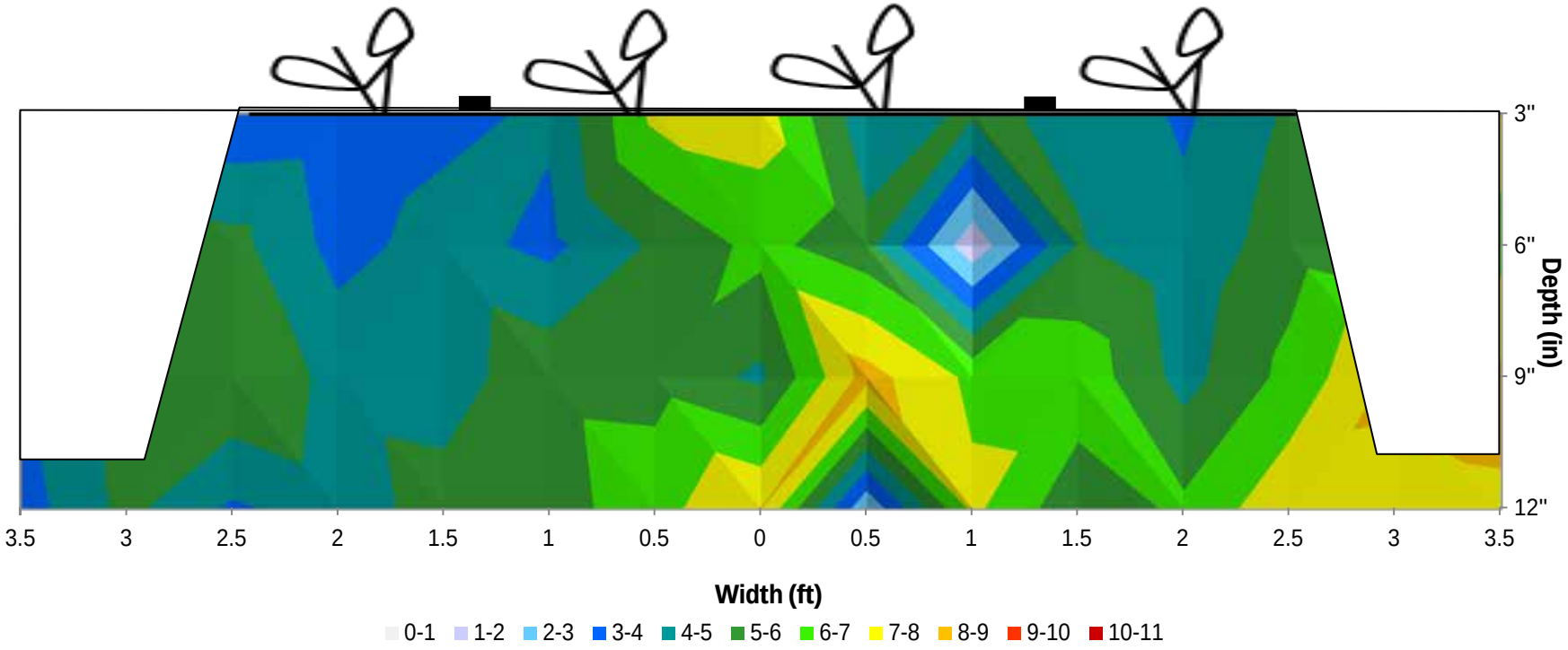
Rice Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 4/17/12

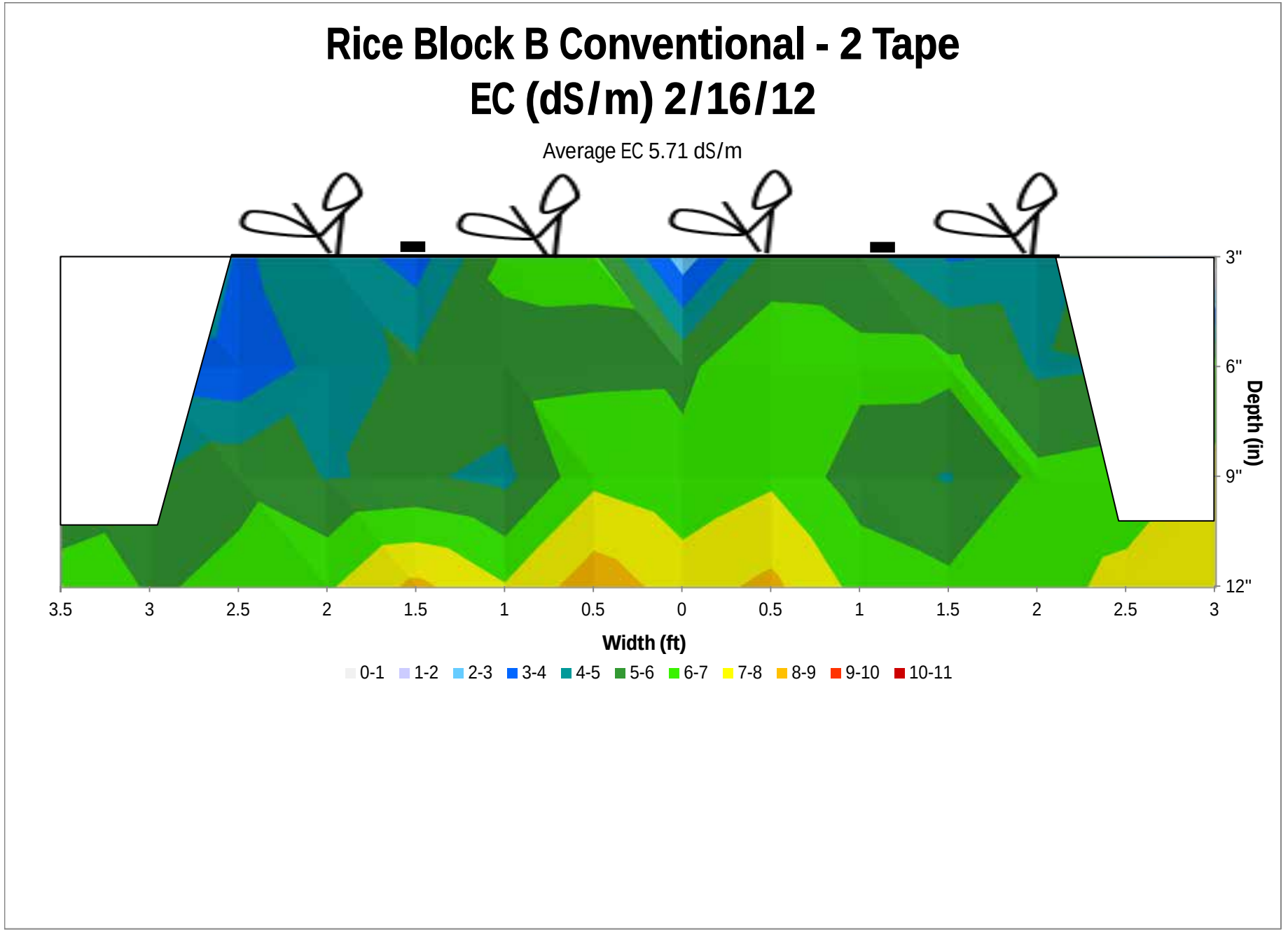
Average EC 3.54 dS/m

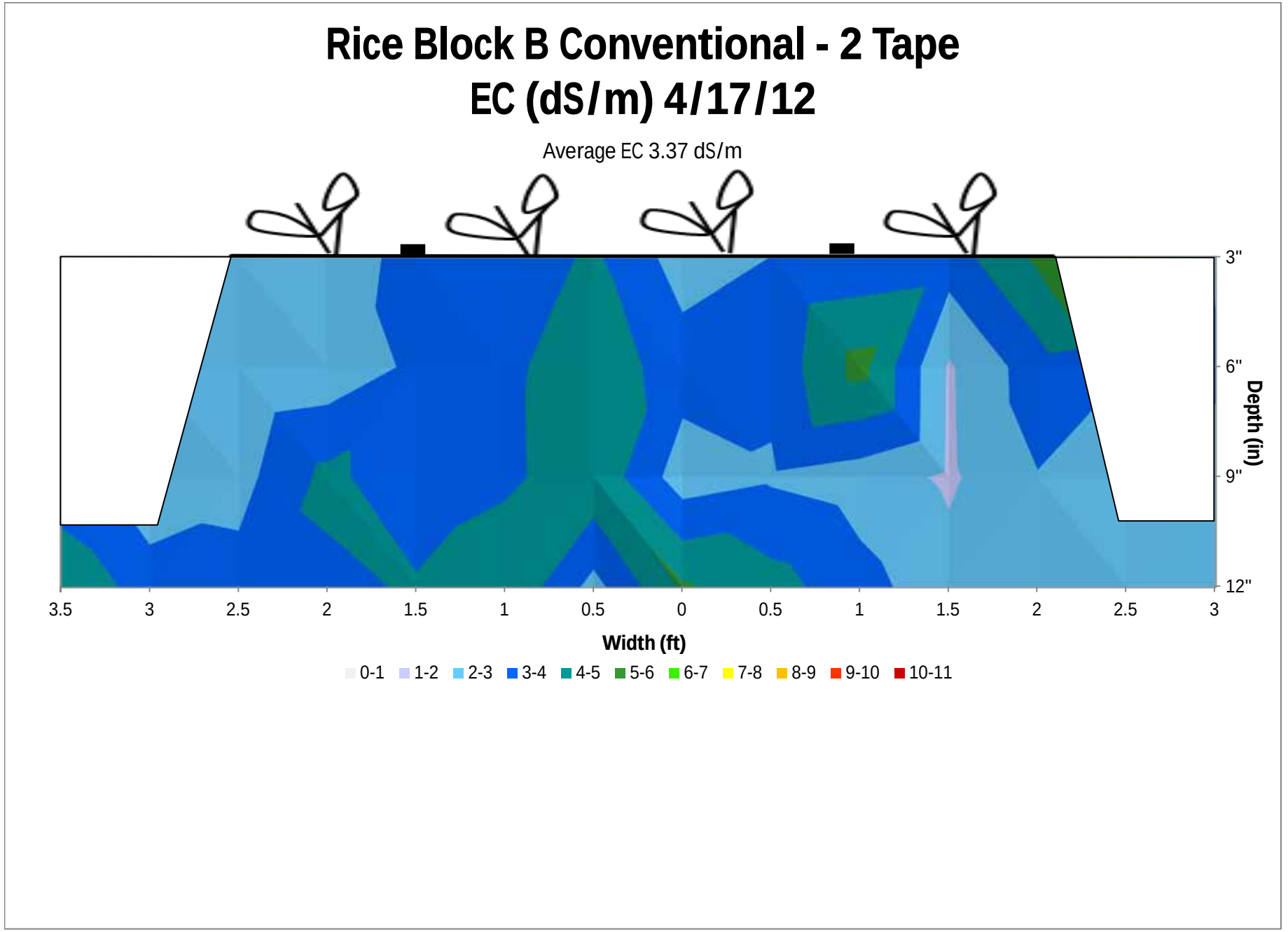


Rice Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 5/7/12

Average EC 5.25 dS/m

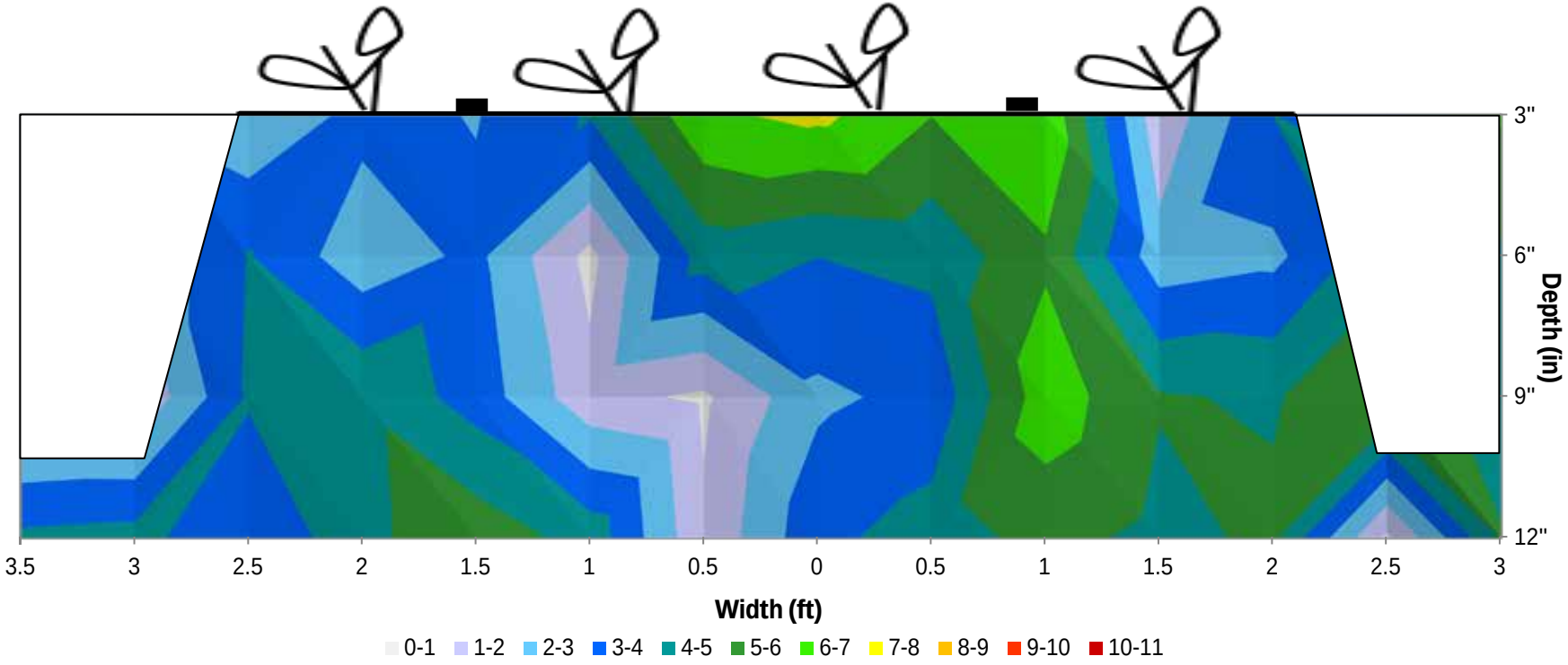



Rice Block B Conventional - 2 Tape
EC (dS/m) 2/16/12
Average EC 5.71 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11


Rice Block B Conventional - 2 Tape
EC (dS/m) 4/17/12
Average EC 3.37 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11

Rice Block B Conventional - 2 Tape
EC (dS/m) 5/7/12

Average EC 3.96 dS/m



Ramon

Ramon - Block A

Reduced Sprinkler

1/19/12 – 65 DAP

2/10/12 – 87 DAP

2/16/12 – 93 DAP

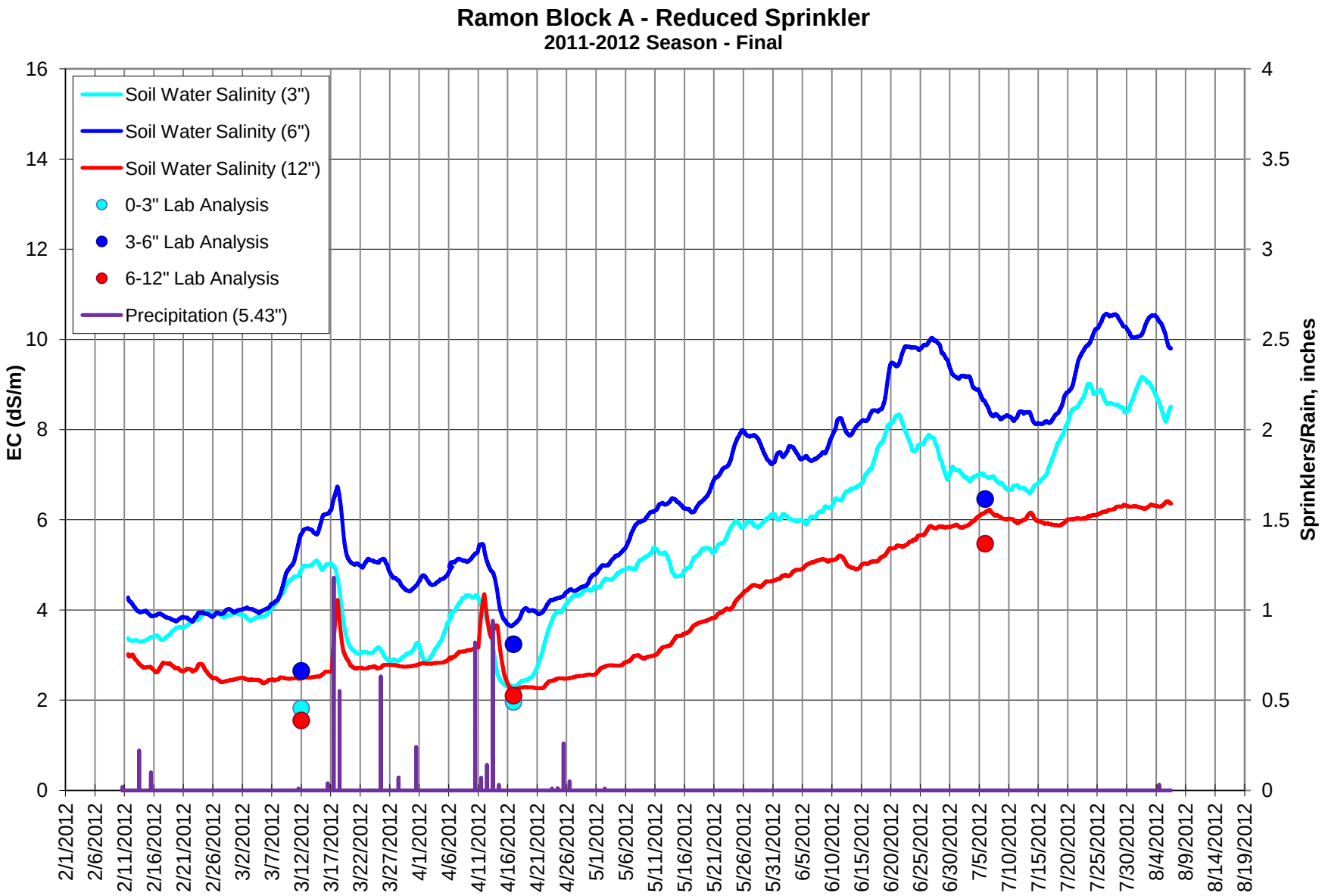
4/6/12 – 143 DAP

Ramon - Block A

Reduced Sprinkler

5/15/12 – 182 DAP

7/6/12 – 234 DAP


Ramon Block A - Reduced Sprinkler
2011-2012 Season - Final
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Precipitation (5.43")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
2/1/2012
2/6/2012
2/11/2012
2/16/2012
2/21/2012
2/26/2012
3/2/2012
3/7/2012
3/12/2012
3/17/2012
3/22/2012
3/27/2012
4/1/2012
4/6/2012
4/11/2012
4/16/2012
4/21/2012
4/26/2012
5/1/2012
5/6/2012
5/11/2012
5/16/2012
5/21/2012
5/26/2012
5/31/2012
6/5/2012
6/10/2012
6/15/2012
6/20/2012
6/25/2012
6/30/2012
7/5/2012
7/10/2012
7/15/2012
7/20/2012
7/25/2012
7/30/2012
8/4/2012
8/9/2012
8/14/2012
8/19/2012

Ramon - Block B

Conventional

1/19/12 – 65 DAP

2/10/12 – 87 DAP

2/16/12 – 93 DAP

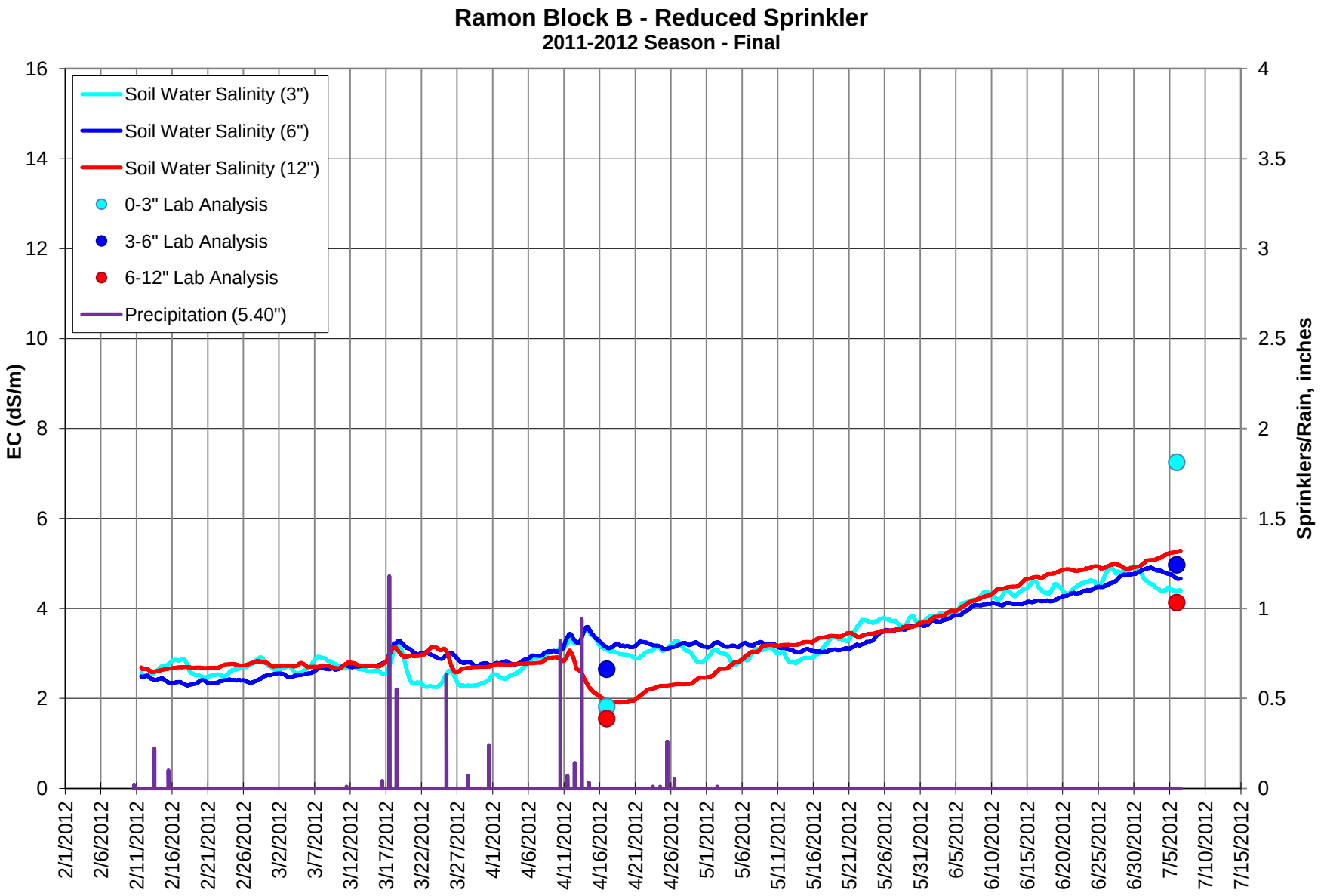
4/6/12 – 143 DAP

Ramon - Block B

Conventional

5/15/12 – 182 DAP

7/6/2012 – 234 DAP

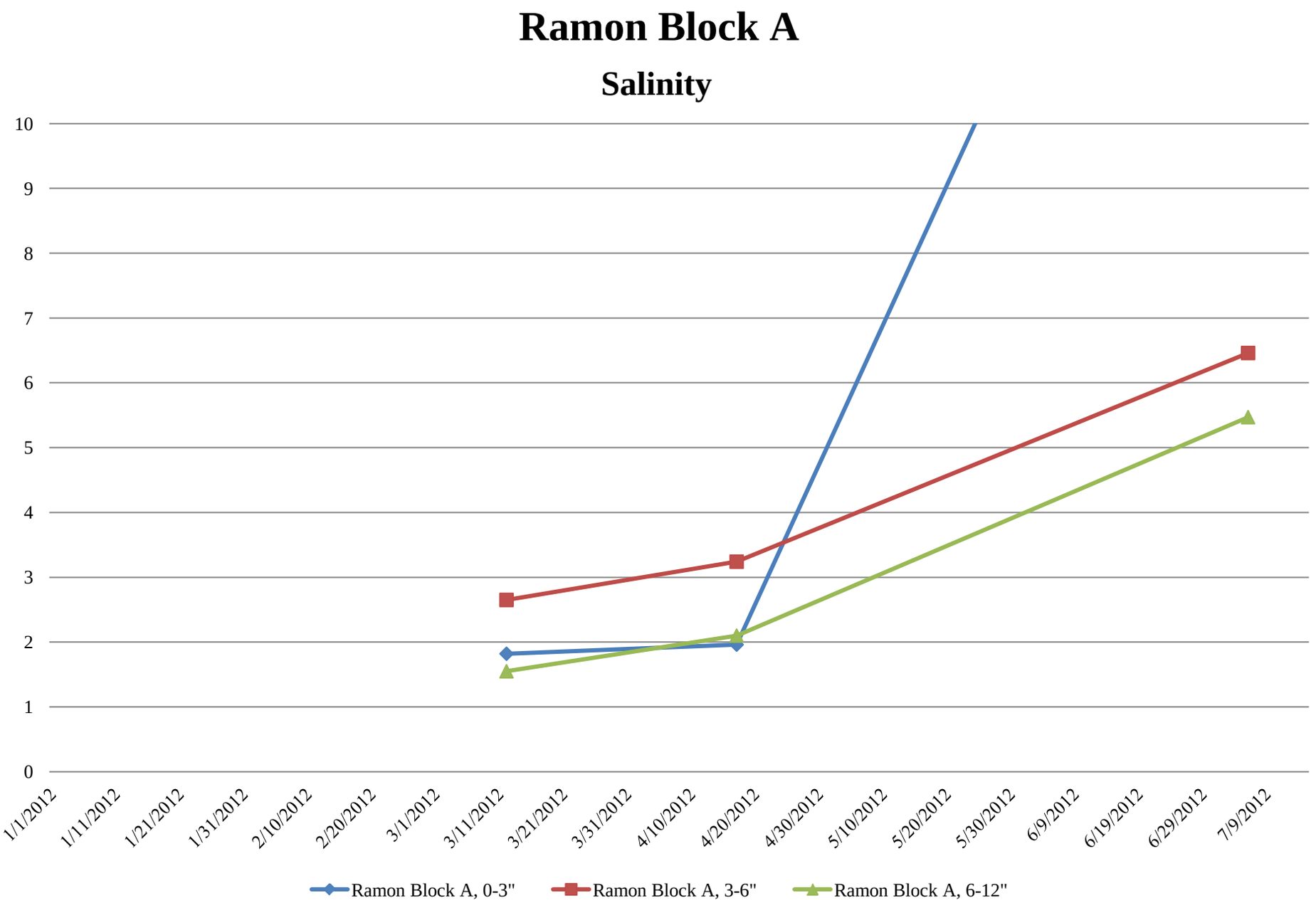

Ramon Block B - Reduced Sprinkler
2011-2012 Season - Final
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Precipitation (5.40")
EC (dS/m)
Sprinklers/Rain, inches
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2
2.5
3
3.5
4
2/1/2012
2/6/2012
2/11/2012
2/16/2012
2/21/2012
2/26/2012
3/2/2012
3/7/2012
3/12/2012
3/17/2012
3/22/2012
3/27/2012
4/1/2012
4/6/2012
4/11/2012
4/16/2012
4/21/2012
4/26/2012
5/1/2012
5/6/2012
5/11/2012
5/16/2012
5/21/2012
5/26/2012
5/31/2012
6/5/2012
6/10/2012
6/15/2012
6/20/2012
6/25/2012
6/30/2012
7/5/2012
7/10/2012
7/15/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Ramon Blocks

ITRC Report No. R 12-005

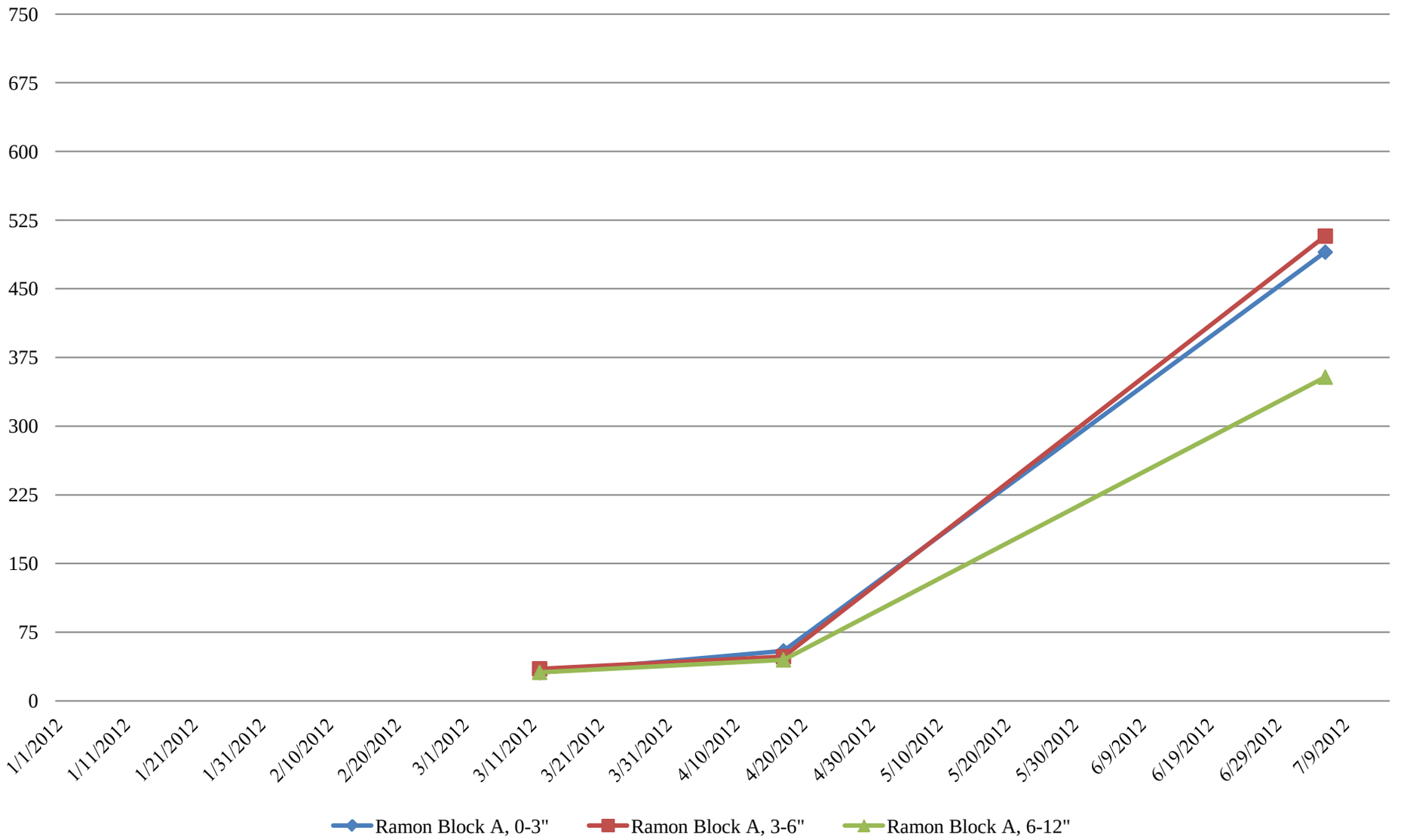
Date:		3/12/2012			4/17/2012			7/6/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DLS	1.82	30.80	DLS	1.96	54.60	DLS	19.20	490.00
	3-6"	DLS	2.65	35.00	DLS	3.24	48.30	DLS	6.46	507.50
	6-12"	DLS	1.55	31.15	DLS	2.10	44.80	DLS	5.47	353.50
Block B	0-3"	SSS			SSS	1.82	30.80	SSS	7.25	451.50
	3-6"	SSS			SSS	2.65	35.00	SSS	4.97	224.00
	6-12"	SSS			SSS	1.55	31.15	SSS	4.13	169.05

Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler


Ramon Block A
Salinity
10
9
8
7
6
5
4
3
2
1
0
1/1/2012
1/11/2012
1/21/2012
1/31/2012
2/10/2012
2/20/2012
3/1/2012
3/11/2012
3/21/2012
3/31/2012
4/10/2012
4/20/2012
4/30/2012
5/10/2012
5/20/2012
5/30/2012
6/9/2012
6/19/2012
6/29/2012
7/9/2012
Ramon Block A, 0-3"
Ramon Block A, 3-6"
Ramon Block A, 6-12"

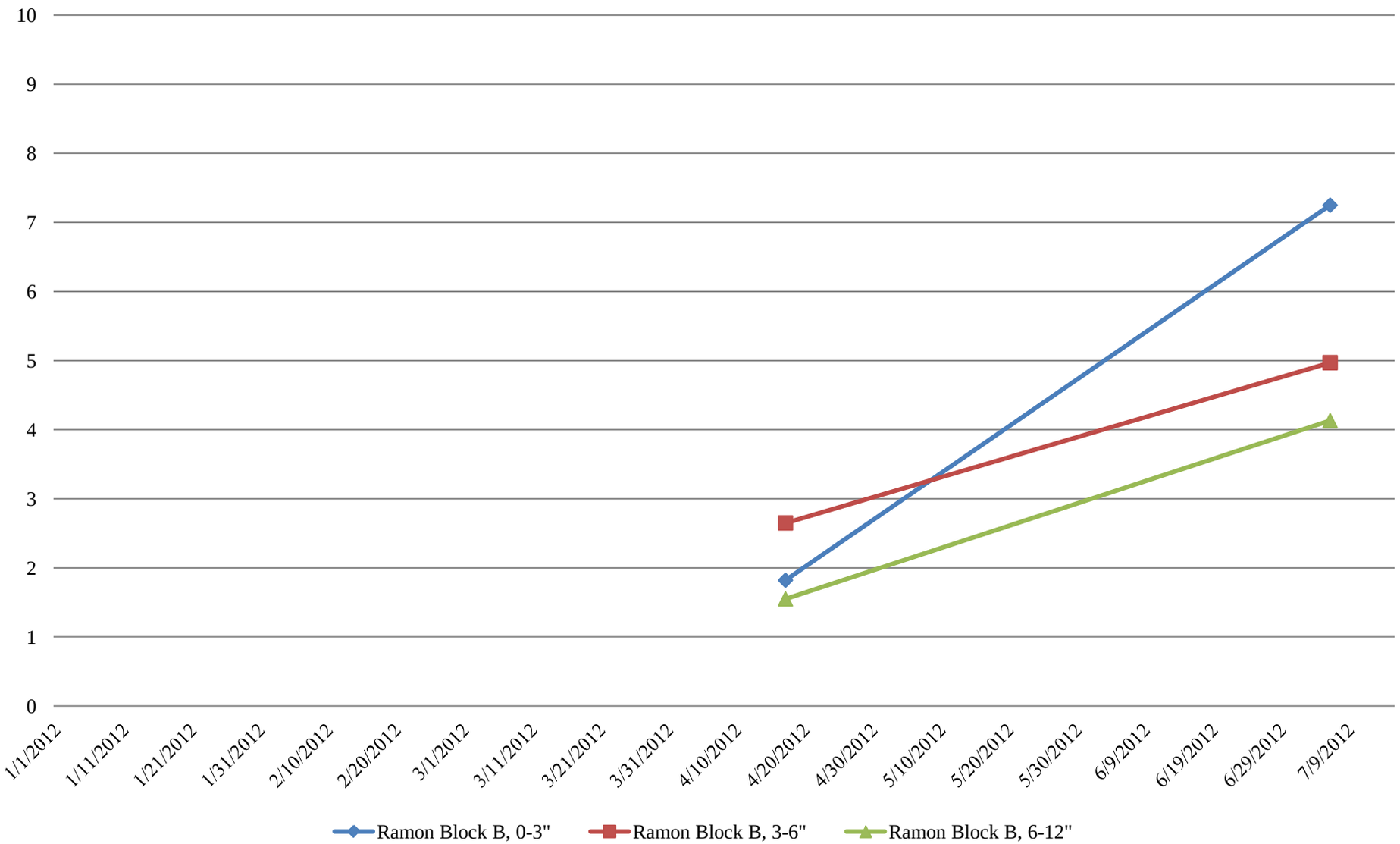
Ramon Block A

Chloride



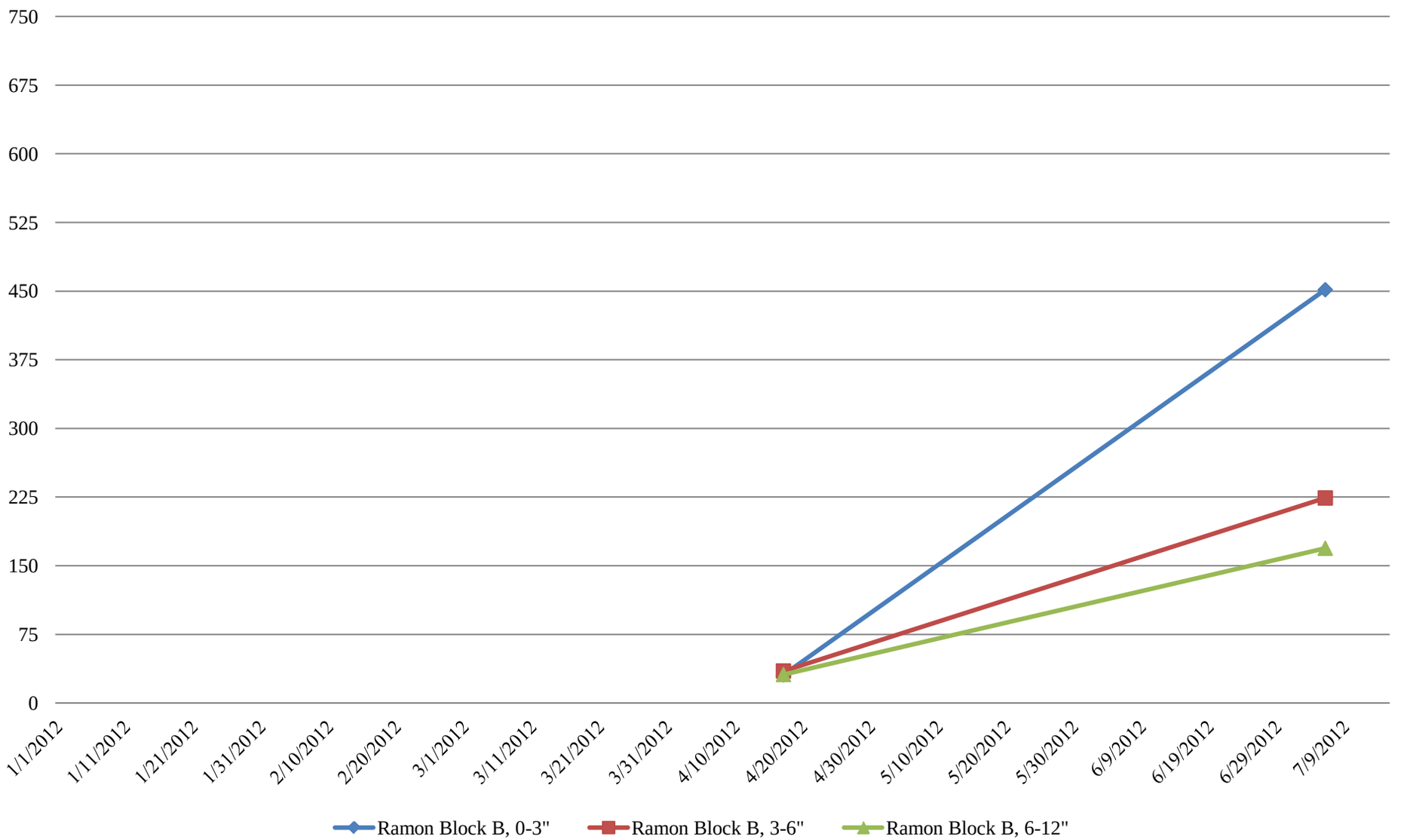
Ramon Block B

Salinity



Ramon Block B

Chloride

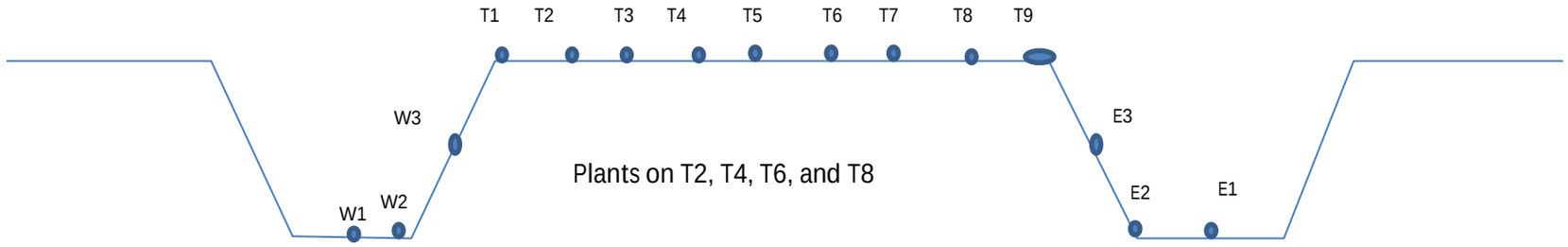


Salinity Data - Top 3 inches

Ramon Block A & B

Using 5TE Sensor and ProCheck

Salinity +8



Block A - 19 Jan. 2012 North

Ramon	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	10.47	4.25	4.1	3.25	2.51	7.44	6.53	7.99	6.65	3.54	4.74	4.81	6.05	6.65	12.84
Temp (F)	59.2	60.3	59.9	62.4	62.6	61.9	61.3	61.2	60.6	60.3	60.3	60.6	60.4	59.4	58.6
% Moisture	14.7	17.3	17.8	12.1	16.8	14.8	16.3	15.8	14	15.8	18.4	9.6	13.6	19	15.2

Block B - 19 Jan. 2012 South

Ramon	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	7.7	18.32	16.56	2.2	7.36	4.81	6.52	10.27	8.44	4.61	5.38	2.1	13.37	11.4	17.2
Temp (F)	57.7	55.6	56.5	58.5	58.5	58.6	58.6	59.2	59.2	59.2	59.2	59	59.2	58.8	58.1
% Moisture	18.6	19.1	13.9	14.1	17.8	13.6	18	13.6	18.4	15.1	19.3	13.6	13.7	16.9	18.4

Block A - 10 Feb. 2012 North

Ramon	West														East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	3.11	4.51	3.39	2.28	2.84	5.83	5.37	4.9	7.54	3.43	4.56	4.7	5.64	7.36	7.35
Temp (F)	77.5	76.1	75.9	76.5	76.8	76.1	75.6	75.4	75.6	75.4	74.8	74.7	74.3	73.4	72.5
% Moisture	14.4	19.1	18.2	12.9	18.2	14.5	20.2	17.6	20.9	15.4	20.8	12.4	14.8	18.5	16.7

Block B - 10 Feb. 2012 South

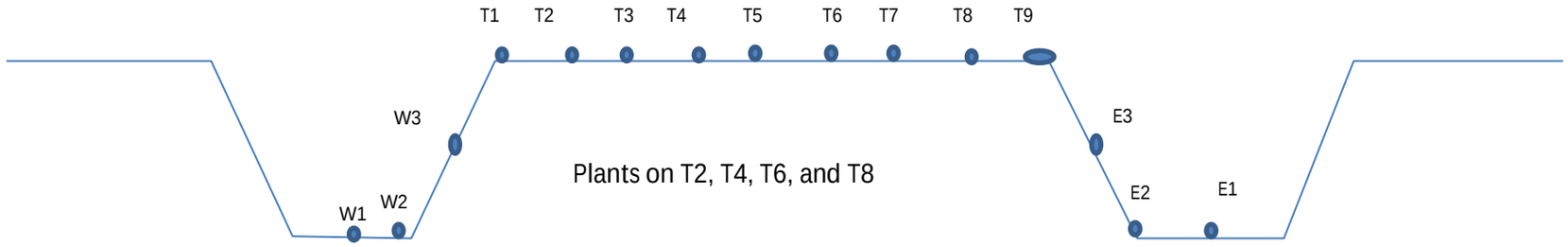
Ramon	West														East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	8.86	5.49	3.15	3.62	4.18	3.08	3.17	7.09	4.92	3.98	3.48	2.3	3.82	6.3	9.41
Temp (F)	61.9	62.8	64.4	67.8	69.6	69.8	69.8	69.8	69.3	68.5	68	67.5	67.3	66.7	66
% Moisture	18.6	23.3	21.5	21.6	20.4	17.3	17.4	17.4	17.8	15.4	16.5	15	20.7	22.7	16.2

Salinity Data - Top 3 inches

Ramon Block A & B

Using 5TE Sensor and ProCheck

Salinity +8



Block A - 6 April 2012 North

Ramon	West													East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	3.85	7.43	7.41	2.71	4.53	6.21	12.85	2.88	4.66	5.24	3.82	4.31	7.05	x
Temp (F)	x	84.2	83.7	84	84.7	84.2	83.8	83.8	84.4	84.2	84.6	84	83.7	83.3	x
% Moisture	x	14.2	12.4	10.2	12.9	14.2	16.4	17	16.1	13.5	17	14.1	13.6	17.9	x

Block B - 6 April 2012 South

Ramon	West													East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	1.66	2.12	2.66	4.66	6.53	5.83	7.33	5.68	5.17	1.3	3.66	4.32	3.42	x
Temp (F)	x	82.4	82	82	82.4	82.9	83.7	83.8	83.5	83.3	82.2	81.9	81.5	81	x
% Moisture	x	19.3	12.8	15.1	16.1	15.5	12.8	11.5	16.2	15	20.9	20.4	20.6	20.7	x

Block A - 15 May 2012 North

Ramon	West													East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	7.5	6.71	3.4	4.1	6.12	7.25	11.42	4.57	5.81	5.92	1.97	6.56	2.3	x
Temp (F)	x	96.1	95.2	94.6	92.8	89.8	87.8	84.6	89.1	81.1	80.1	80.4	79.3	78.6	x
% Moisture	x	15.9	12.1	15.1	17	14.7	16.9	20.3	18	17.2	16.8	13.4	14.2	16.3	x

Block B - 15 May 2012 South

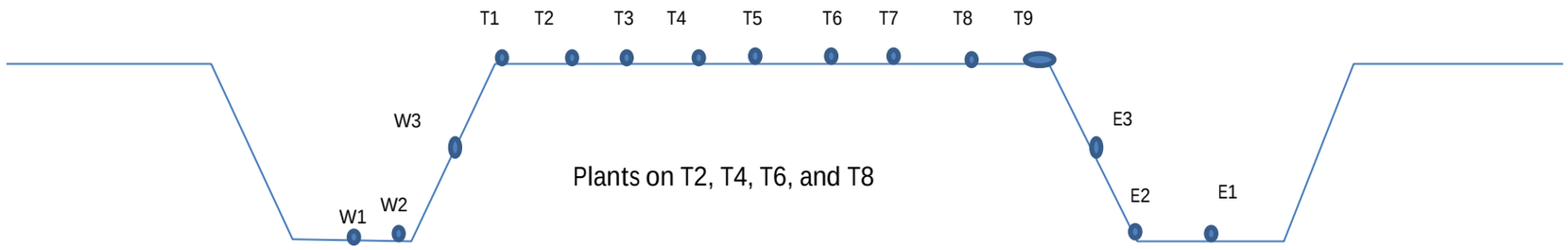
Ramon	West													East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	x	1.51	1.86	7.92	4.29	3.21	3.49	4.76	3.62	5.78	3.7	4.04	4.39	6.89	x
Temp (F)	x	86.9	86.7	86	84.6	83.5	83.5	82.9	82.4	81.9	82.9	83.1	84	84	x
% Moisture	x	19.8	17.3	20.3	18.4	18.2	16.8	16.4	15.6	18.5	18.5	19.3	21.6	15.5	x

Salinity Data - Top 3 inches

Ramon Block A & B

Using 5TE Sensor and ProCheck

Salinity +8



Block A - 6 July 2012 North

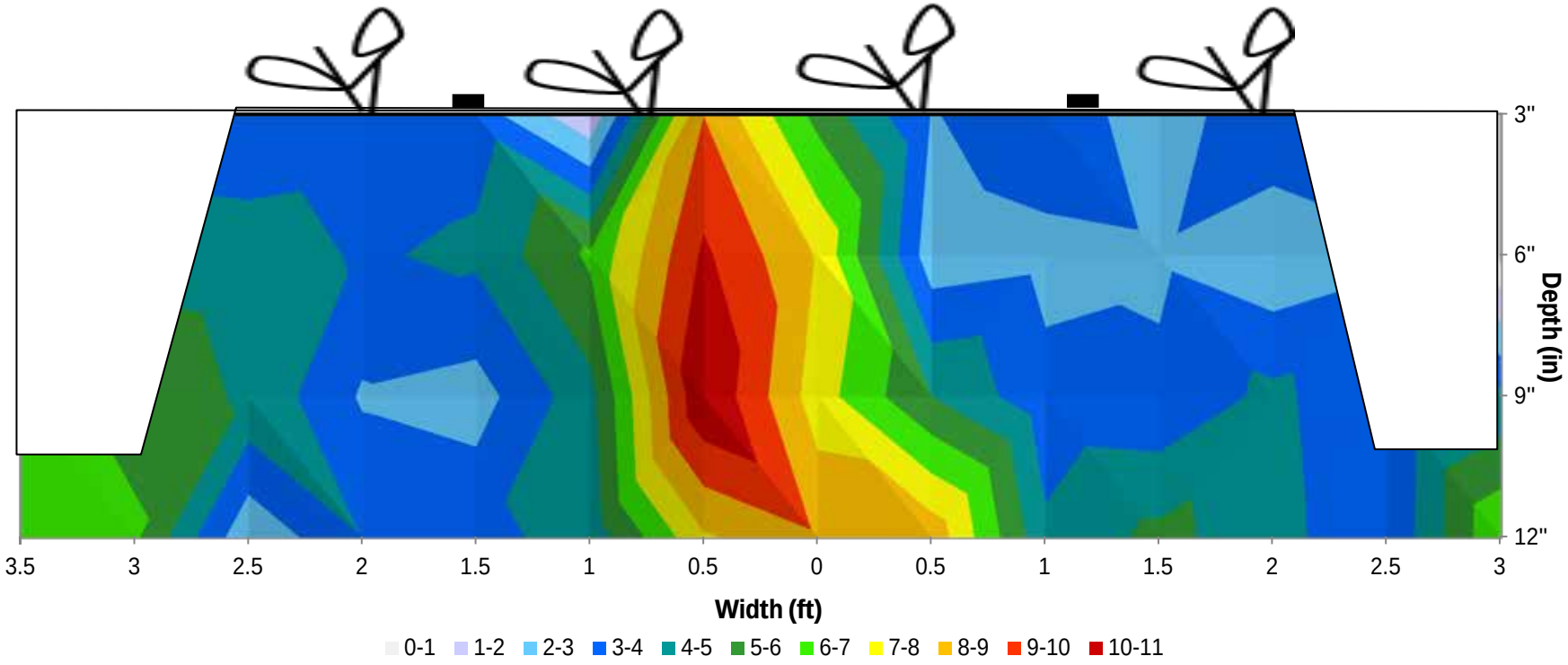
Ramon	West													East
Blk A	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	X	6.88	12.49	2.1	4.25	3.4	4.43	7	4.35	3.56	2.04	6.36	9.84	9.76	X
Temp (F)	X	84.6	83.8	83.3	82.9	82.2	81.9	81	80.6	80.2	19.5	79.3	80.2	81.2	X
% Moisture	X	13.3	11.8	12.8	15.1	17.2	18.8	17.7	21.4	17.4	18.5	20.3	14.6	16.6	X

Block B - 6 July 2012 South

Ramon	West													East
Blk B	W1	W2	W3	T1	T2	T3	T4	T5	T6	T7	T8	T9	E3	E2	E1
Salinity (dS/m)	5.5	2.79	3.26	2.47	7.73	2.99	1.06	4.39	6.18	3.24	4.72	3.53	6.13	5.16	X
Temp (F)	99.3	99.1	96.3	93	88.9	87.4	87.3	86.5	85.8	83.8	83.5	83.1	83.7	84	X
% Moisture	18.4	19.3	19	19.9	20.2	19.4	19.4	17.7	15.8	18.4	18.6	17.4	16.1	18.6	X

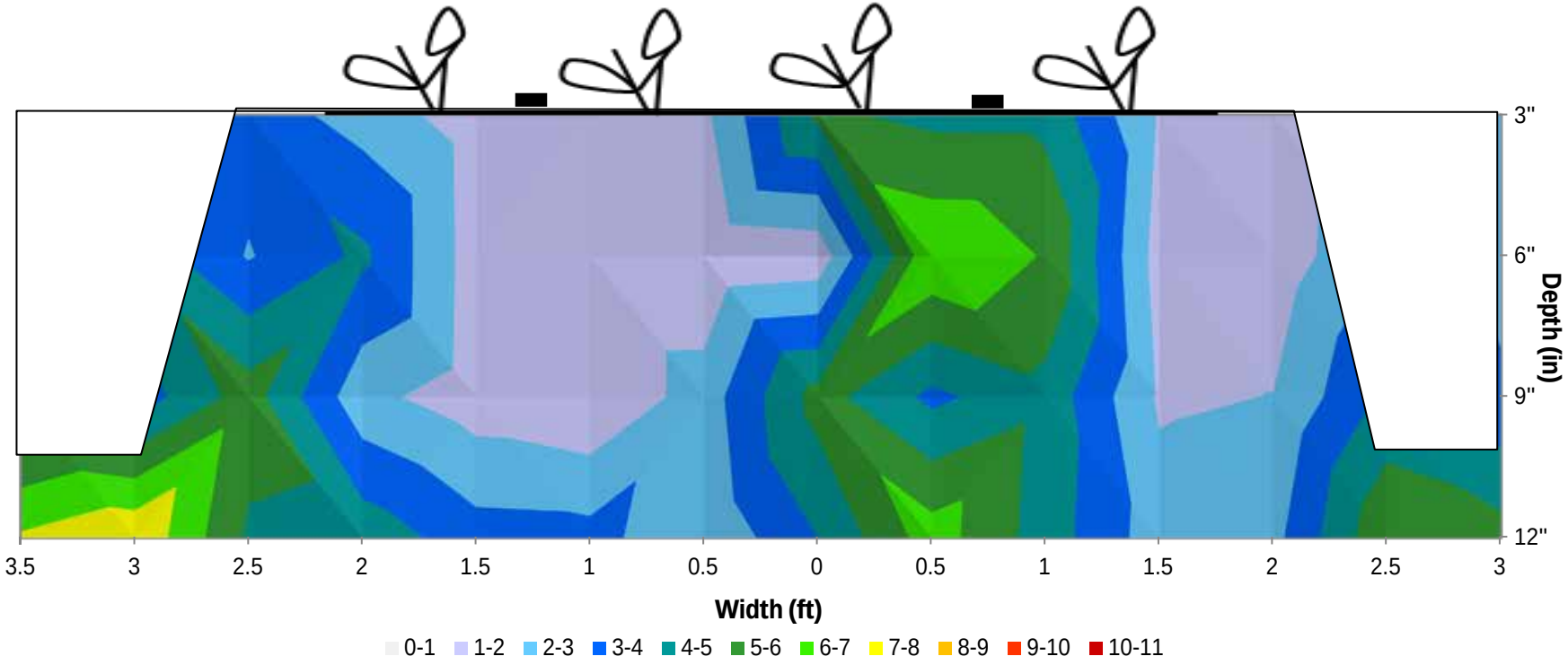
Ramon Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 2/16/12

Average EC 4.62 dS/m



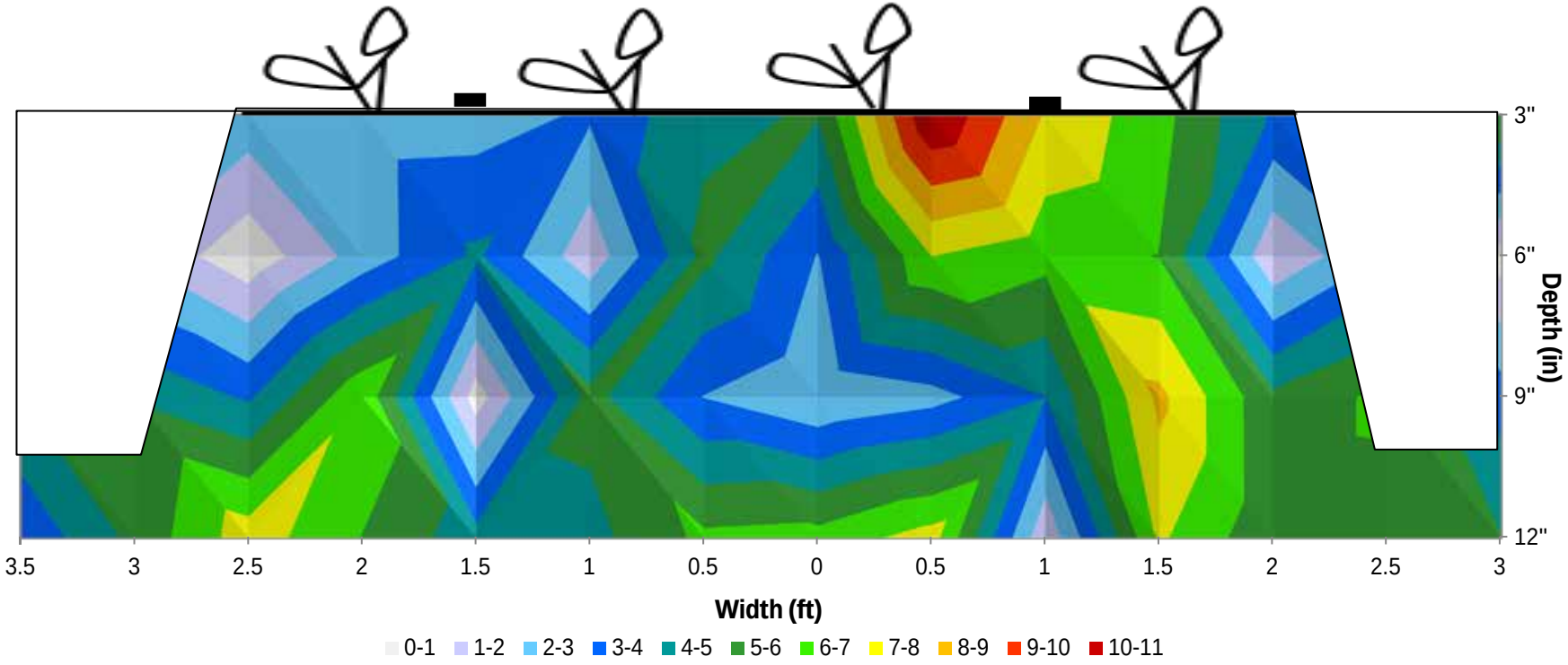
Ramon Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 4/17/12

Average EC 3.40 dS/m



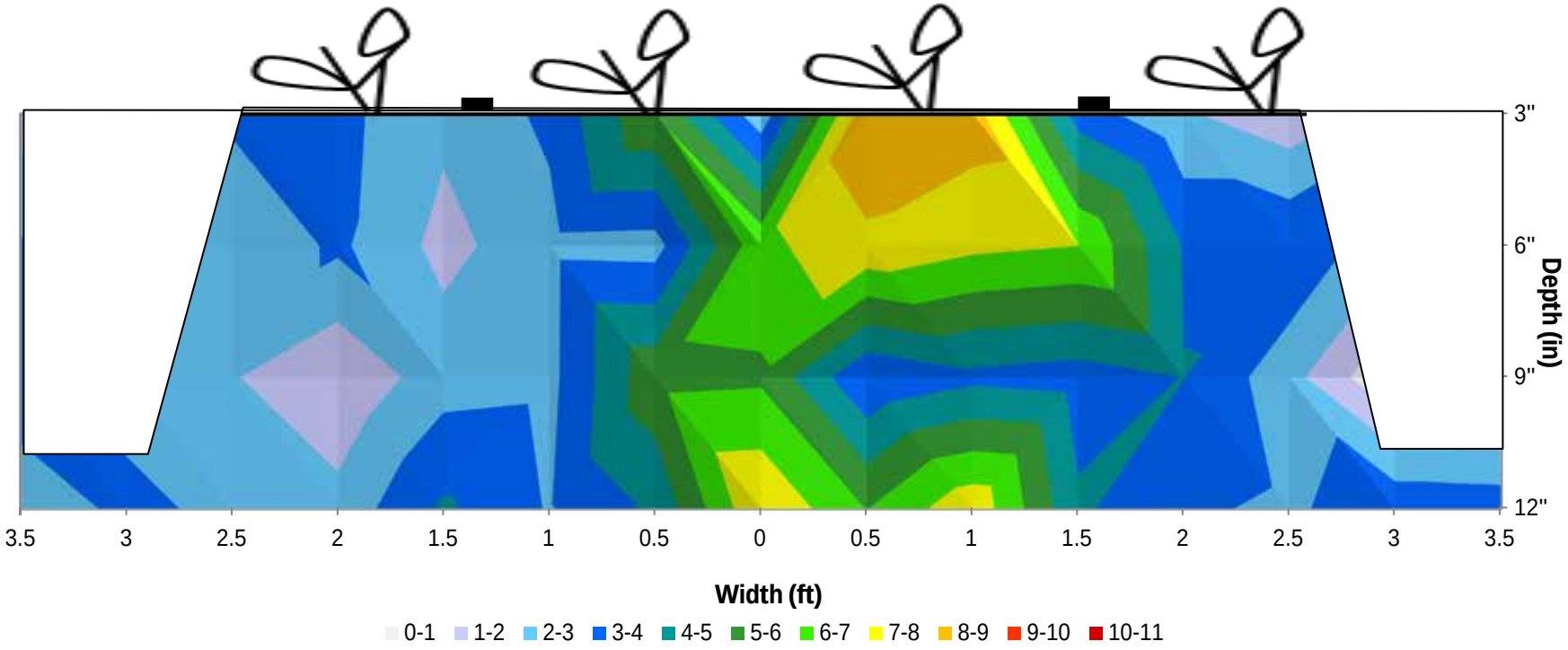
Ramon Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 5/7/12

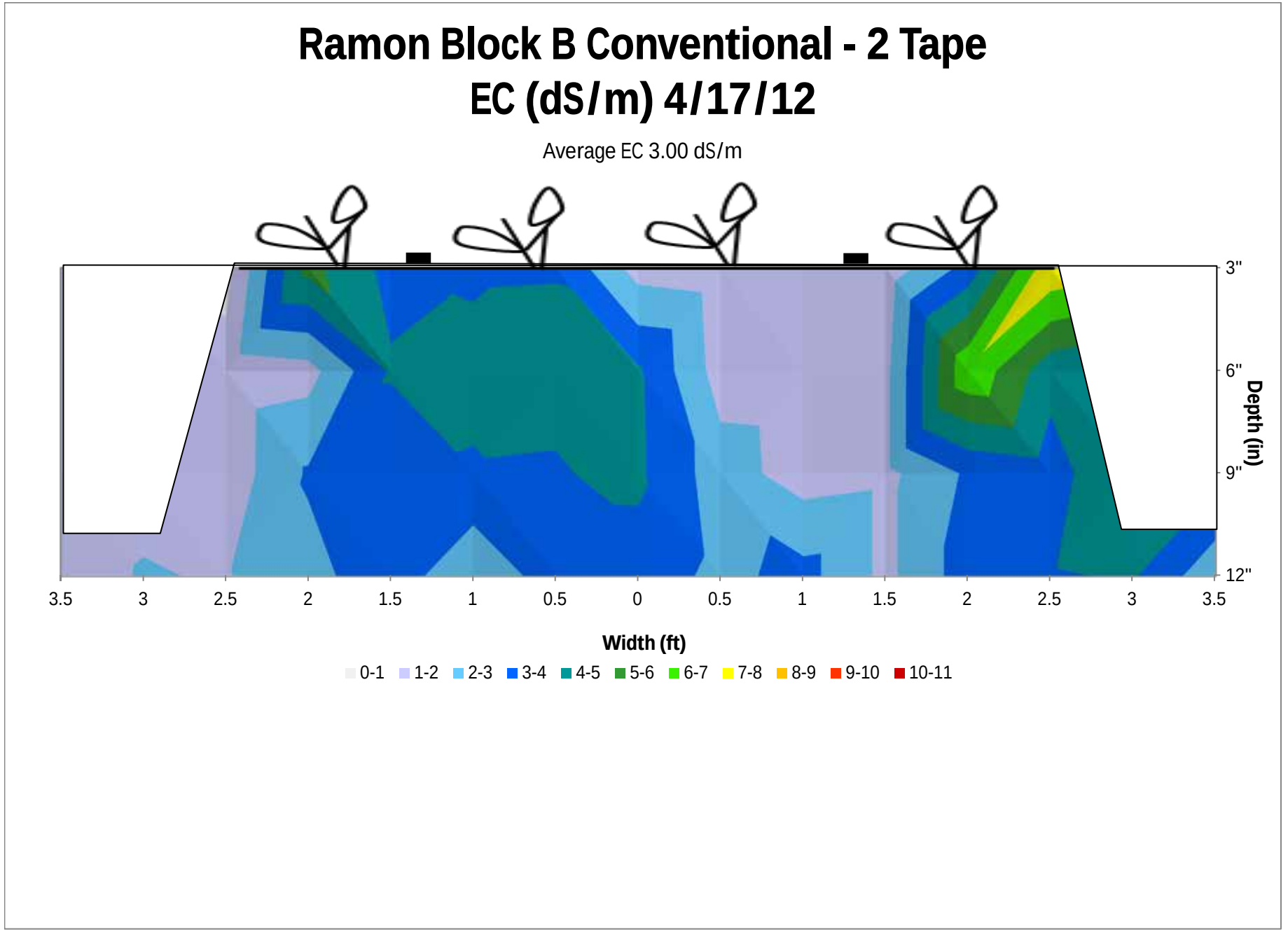
Average EC 3.40 dS/m



Ramon Block B Conventional - 2 Tape
EC (dS/m) 2/16/12

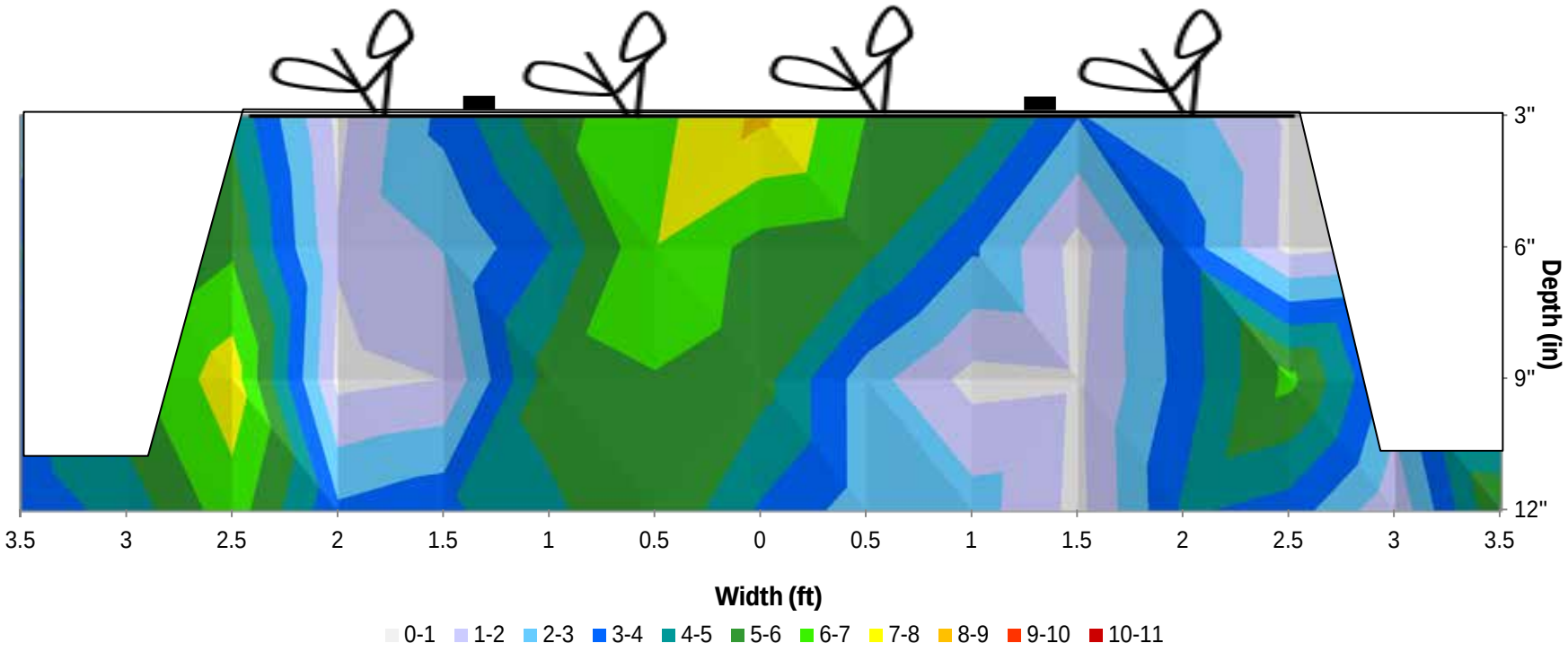
Average EC 3.79 dS/m




Ramon Block B Conventional - 2 Tape
EC (dS/m) 4/17/12
Average EC 3.00 dS/m
3"
6"
9"
12"
Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
0.5
1
1.5
2
2.5
3
3.5
Width (ft)
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11

Ramon Block B Conventional - 2 Tape
EC (dS/m) 5/7/12

Average EC 3.67 dS/m



Watsonville Blocks 2011-2012

Porter

Porter – Block A

Drip Only

2/12/12 – 38 DAP

3/25/12 – 80 DAP

4/15/12 – 101 DAP

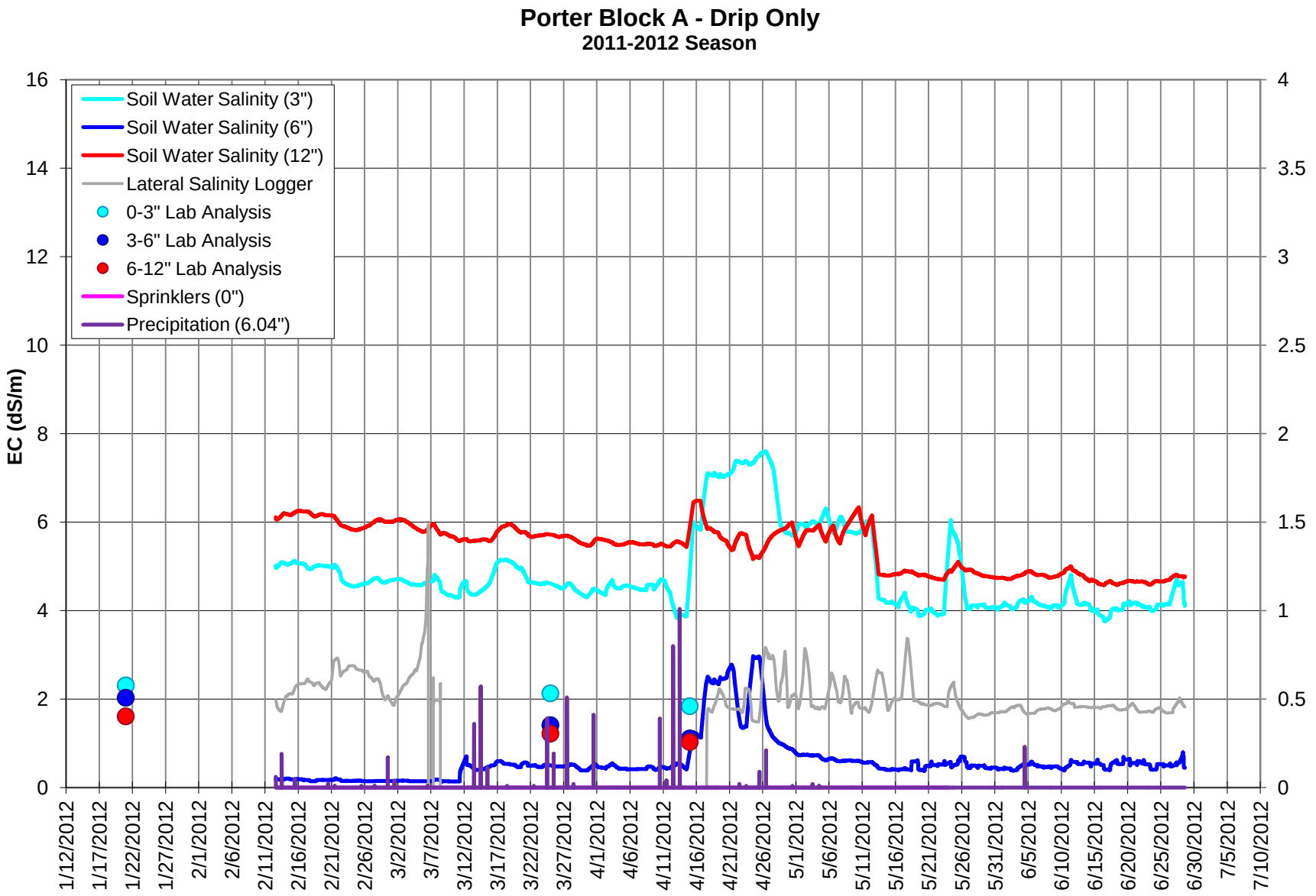
5/13/12 – 129 DAP

Porter – Block A

Drip Only

6/3/12 – 150 DAP

6/28/12 – 175 DAP


Porter Block A - Drip Only
2011-2012 Season
EC (dS/m)
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (0")
Precipitation (6.04")
16
14
12
10
8
6
4
2
0
4
3.5
3
2.5
2
1.5
1
0.5
0
1/12/2012
1/17/2012
1/22/2012
1/27/2012
2/1/2012
2/6/2012
2/11/2012
2/16/2012
2/21/2012
2/26/2012
3/2/2012
3/7/2012
3/12/2012
3/17/2012
3/22/2012
3/27/2012
4/1/2012
4/6/2012
4/11/2012
4/16/2012
4/21/2012
4/26/2012
5/1/2012
5/6/2012
5/11/2012
5/16/2012
5/21/2012
5/26/2012
5/31/2012
6/5/2012
6/10/2012
6/15/2012
6/20/2012
6/25/2012
6/30/2012
7/5/2012
7/10/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Porter Blocks

	Date:	1/21/2012			3/25/2012			4/15/2012			6/3/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DP	2.31	53.90	DP	2.13	74.90	DP	1.84	82.25	DP		
	3-6"	DP	2.03	47.60	DP	1.41	36.40	DP	1.11	52.50	DP		
	6-12"	DP	1.61	41.30	DP	1.22	32.20	DP	1.03	45.85	DP		

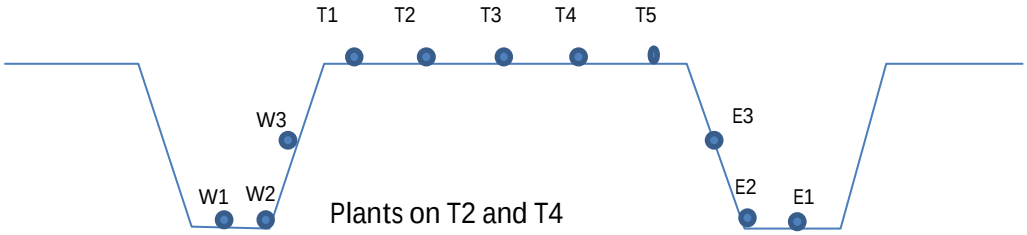
Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

Salinity Data - Top 3 inches

Porter Ranch (Uyematsuo)

Using 5TE Sensor and ProCheck

Salinity +8



Porter Ranch (25-Mar-12)

Porter Ranch	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	3.6	2.5	8.9	2.7	4.3	8.2	4.4	11.6	5.9	3.9	6.0
Temp (F)	72	72	69	68	68	67	65	65	68	68	67
% Moisture	27	28	22	20	25	23	22	20	27	26	26

Porter Ranch (15-Apr-12) - 12:57pm

Porter Ranch	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	3.4	2.2	4.2	4.6	8.8	2.9	2.1	8.6	3.8	5.9	4.3
Temp (F)	74	74	74	74	73	74	73	75	78	78	76
% Moisture	22	20	24	22	21	22	21	21	24	24	23

Porter Ranch (13-May-12) - 1:20pm

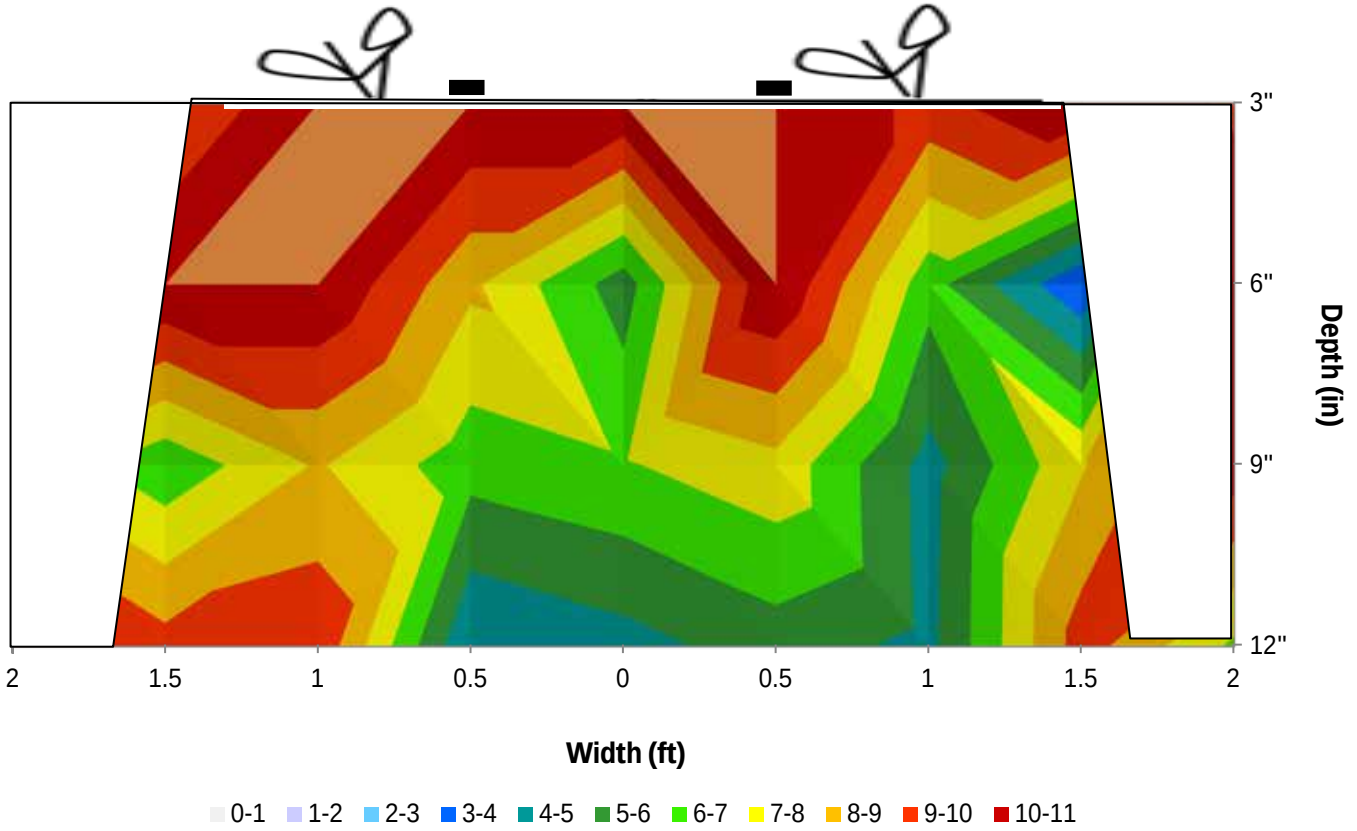
Porter Ranch	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	x	0.1	2.5	0.3	4.8	2.5	7.8	1.1	x	0.2	0.9
Temp (F)	x	77	77	77	76	75	73	73	x	73	73
% Moisture	x	21	21	17	21	20	24	13	x	19	19

Porter Ranch (28-June-12) - 3:20pm

Porter Ranch	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	X	3.3	2.7	1.2	2.5	2.3	1.1	8.8	5.0	6.0	X
Temp (F)	X	100	101	101	100	95	91	89	89	89	X
% Moisture	X	24	19	19	25	27	23	27	24	27	X

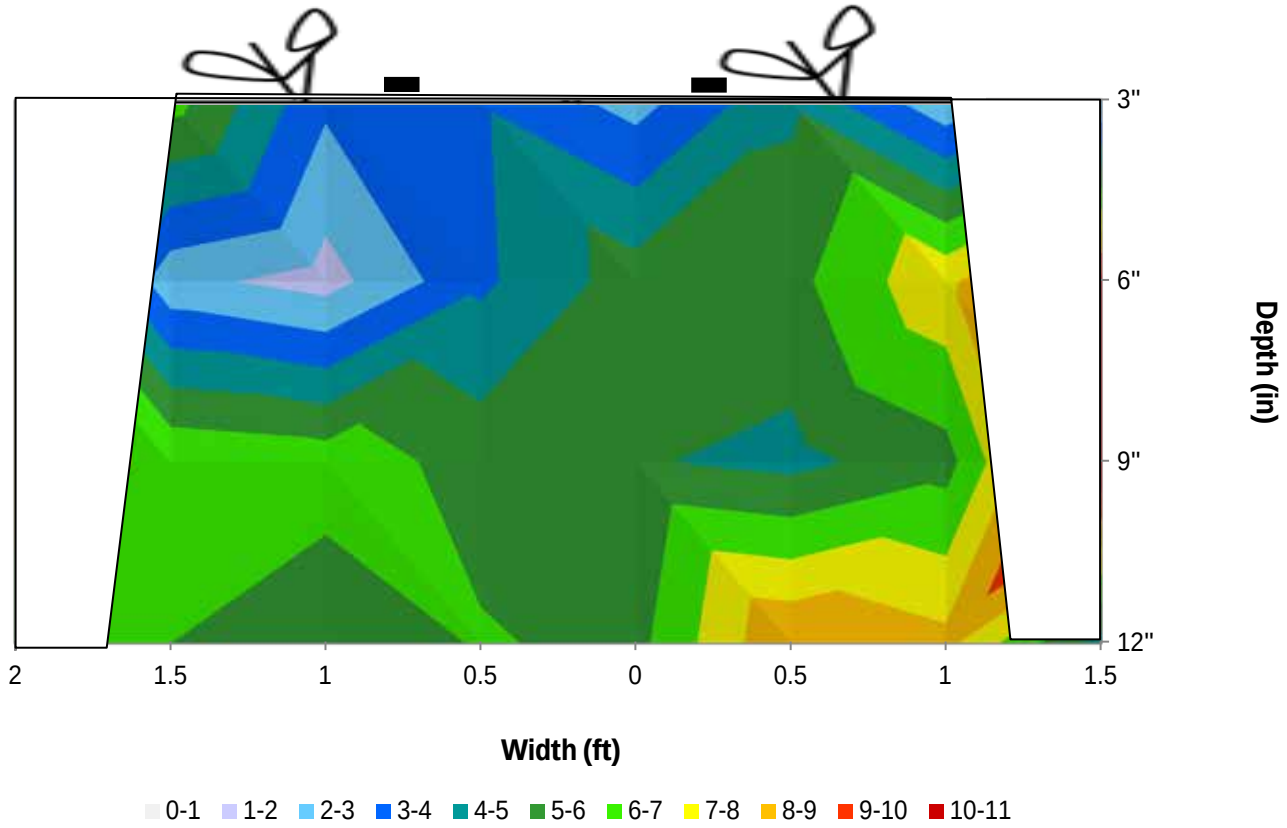
Porter Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 1/22/12

Average EC 8.61 dS/m



Porter Block A Reduced Sprinkler- 2 Tape EC (dS/m) 6/3/12

Average EC 5.64 dS/m



Fegundas

Fegundas – Block A

Drip Only

1/15/12 – 10 DAP

2/12/12 – 38 DAP

3/25/12 – 80 DAP

4/15/12 – 101 DAP

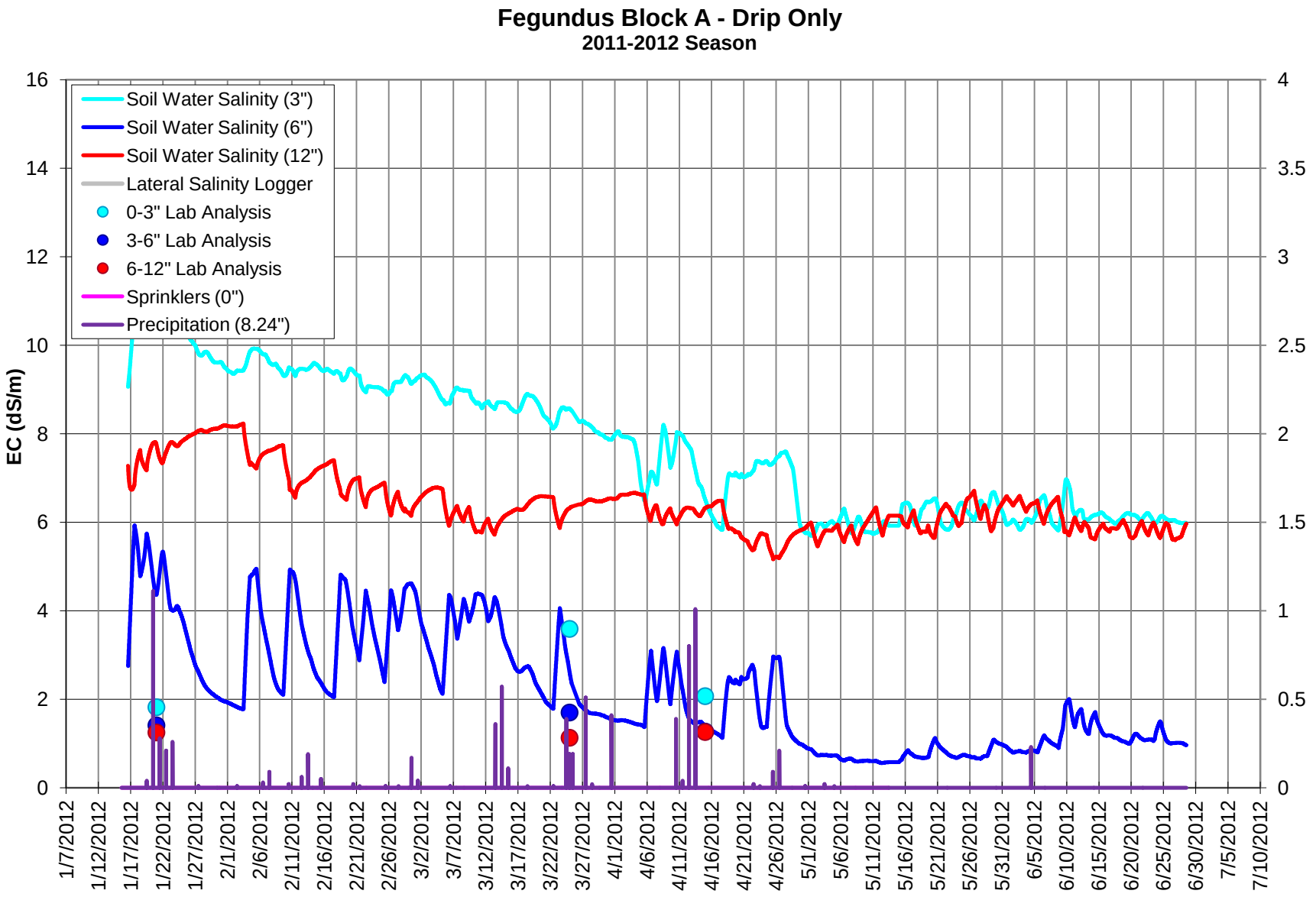
Fegundas – Block A

Drip Only

5/13/12 – 129 DAP

6/3/12 – 150 DAP

6/28/12 – 175 DAP


Fegundus Block A - Drip Only
2011-2012 Season
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (0")
Precipitation (8.24")
EC (dS/m)
16
14
12
10
8
6
4
2
0
4
3.5
3
2.5
2
1.5
1
0.5
0
1/7/2012
1/12/2012
1/17/2012
1/22/2012
1/27/2012
2/1/2012
2/6/2012
2/11/2012
2/16/2012
2/21/2012
2/26/2012
3/2/2012
3/7/2012
3/12/2012
3/17/2012
3/22/2012
3/27/2012
4/1/2012
4/6/2012
4/11/2012
4/16/2012
4/21/2012
4/26/2012
5/1/2012
5/6/2012
5/11/2012
5/16/2012
5/21/2012
5/26/2012
5/31/2012
6/5/2012
6/10/2012
6/15/2012
6/20/2012
6/25/2012
6/30/2012
7/5/2012
7/10/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Fegundas Block

Date:		1/21/2012			3/25/2012			4/15/2012			6/3/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DP	1.82	21.70	DP	3.59	37.80	DP	2.07	27.30	DP		
	3-6"	DP	1.41	18.90	DP	1.70	24.85	DP	1.27	18.90	DP		
	6-12"	DP	1.25	12.25	DP	1.13	17.50	DP	1.26	17.85	DP		

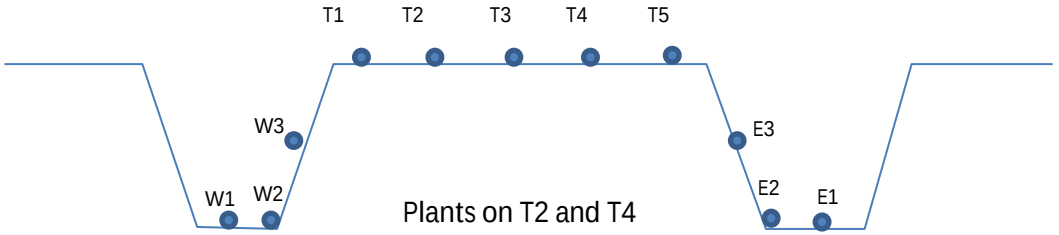
Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

Salinity Data - Top 3 inches

Fegundas (RAC)

Using 5TE Sensor and ProCheck

Salinity +8



Fegundus (22-Jan-12)

Fegundus	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	7.3	4.3	3.5	15.6	9.1	6.6	7.9	15.3	6.9	8.9	19.2
Temp (F)	55	55	55	54	54	54	54	55	54	54	54
% Moisture	33	31	16	12	18	12	19	17	31	28	20

Fegundus (25-Mar-12)

Fegundus	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	5.6	4.1	3.9	0.9	7.3	15.5	4.2	0.7	5.3	6.4	1.9
Temp (F)	63	60	59	57	57	57	57	58	59	59	59
% Moisture	28	37	23	18	22	19	19	15	32	31	17

Fegundus (15-Apr-12) ~ 11:00am

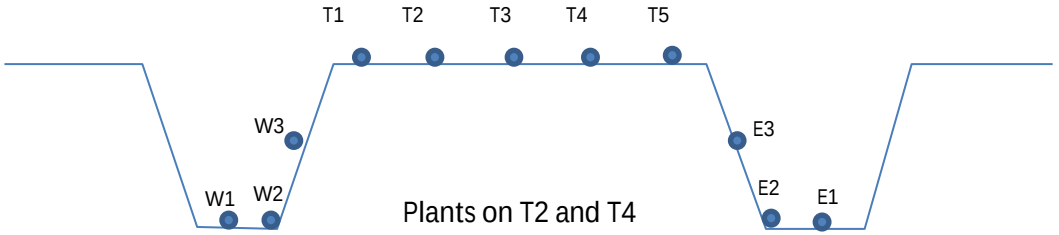
Fegundus	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	5.7	5.5	4.5	0.5	1.9	6.0	0.5	6.6	5.4	4.6	0.2
Temp (F)	81	78	77	75	73	71	72	73	73	72	73
% Moisture	29	28	22	14	22	26	17	21	27	29	18

Salinity Data - Top 3 inches

Fegundas (RAC)

Using 5TE Sensor and ProCheck

Salinity +8



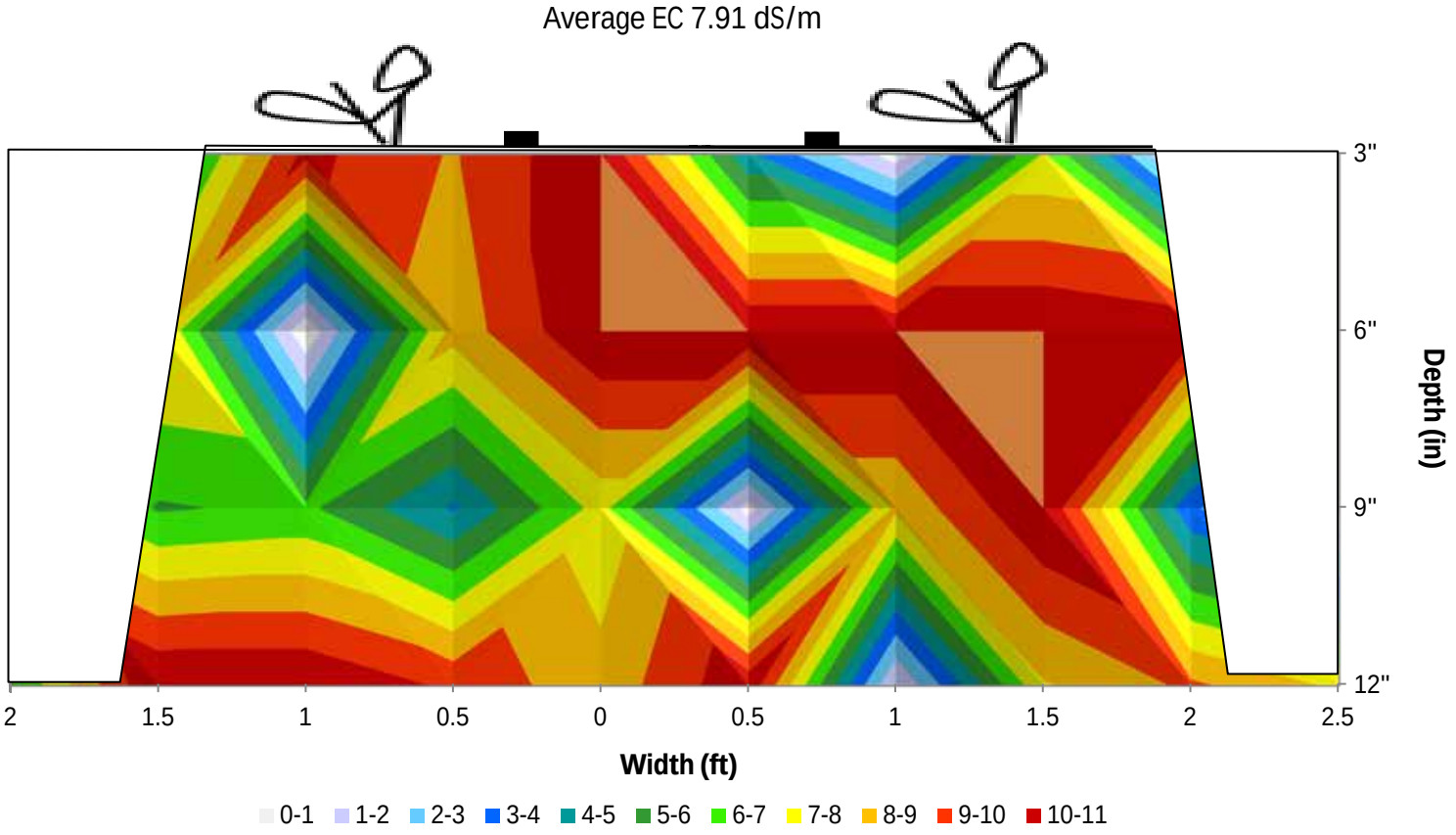
Fegundus (13-May-12) ~ 11:00am

Fegundus	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	0.1	7.2	0.5	3.2	11.2	0.9	2.0	0.7	x	0.2	1.9
Temp (F)	67	67	67	67	66	66	65	66	x	68	67
% Moisture	22	28	17	12	19	18	15	16	x	20	11

Fegundus (28-June-12) ~ 1:00pm

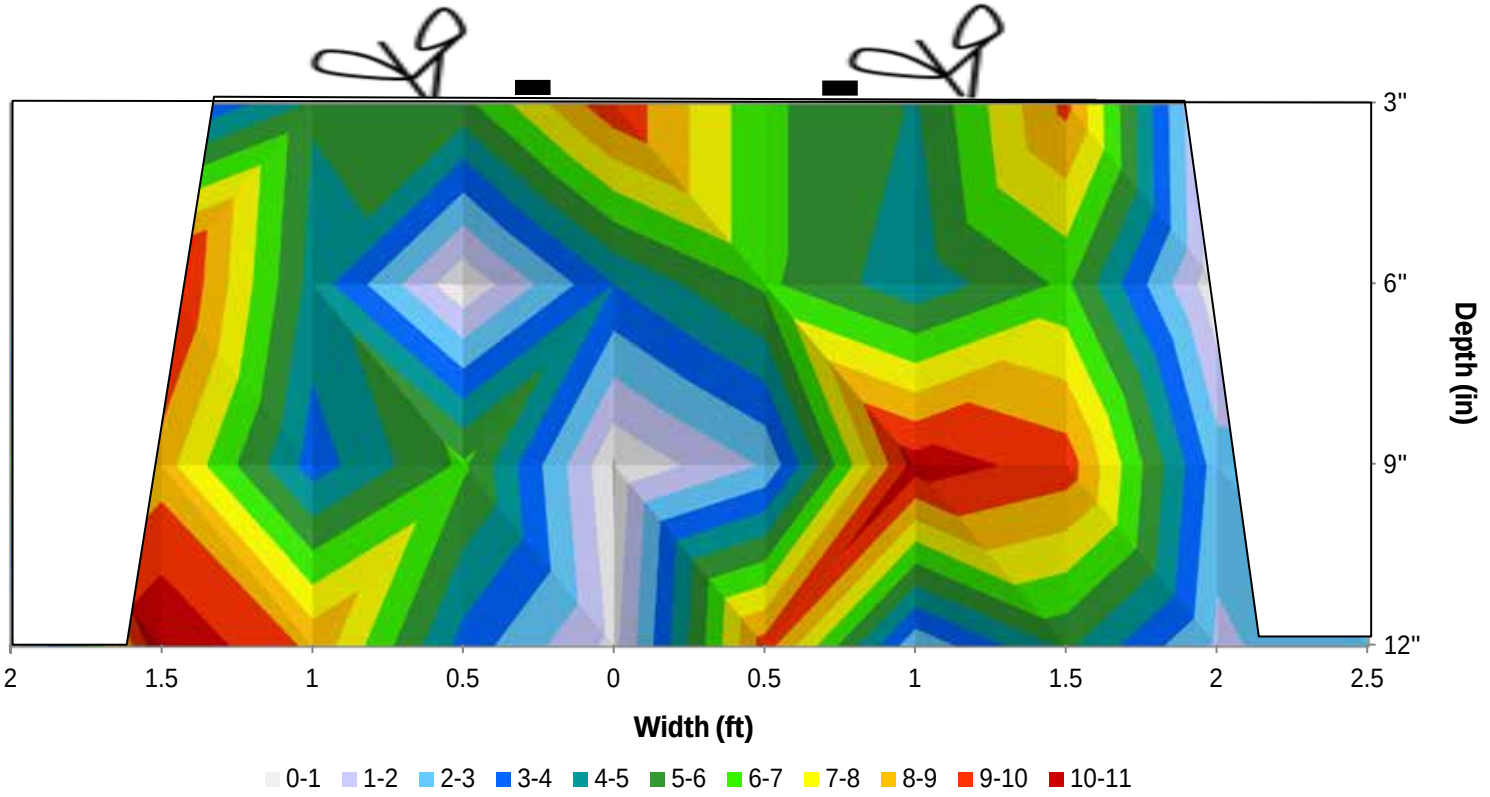
Fegundus	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	X	1.9	3.6	***	3.2	1.1	0.4	2.2	***	X	X
Temp (F)	X	87	89	90	89	90	90	90	91	X	X
% Moisture	X	17	16	10	18	12	14	10	9	X	X

Fegundus Block A Reduced Sprinkler- 2 Tape
EC (dS/m) - 1/22/12



Fegundus Block A Reduced Sprinkler- 2 Tape EC (dS/m) 6/3/12

Average EC 5.27 dS/m



Balich

Balich – Block A

Drip Only

2/12/12 – 38 DAP

4/15/12 – 101 DAP

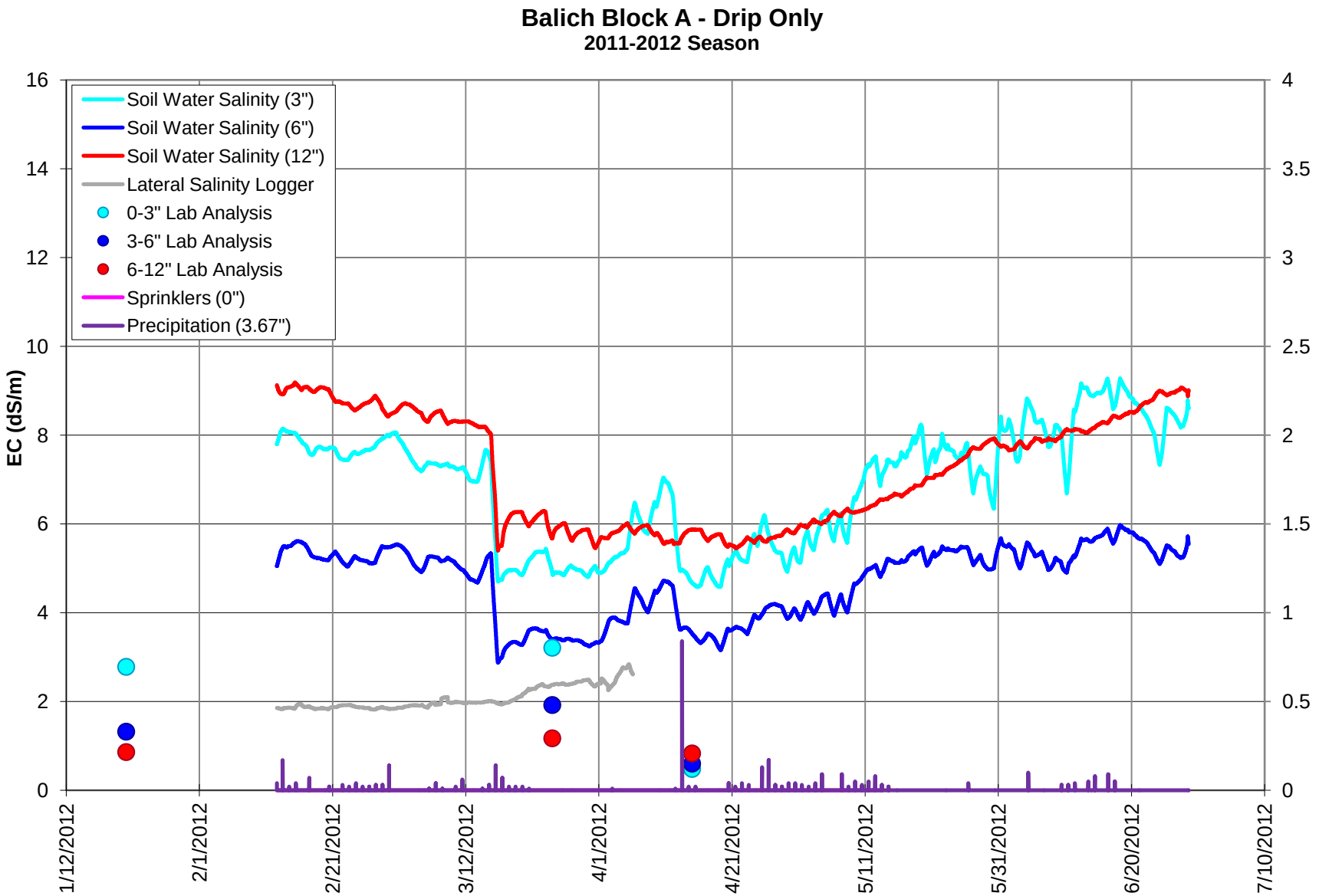
5/13/12 – 129 DAP

6/3/12 – 150 DAP

Balich – Block A

Drip Only

6/28/12 – 175 DAP


Balich Block A - Drip Only
2011-2012 Season
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Lateral Salinity Logger
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (0")
Precipitation (3.67")
EC (dS/m)
16
14
12
10
8
6
4
2
0
4
3.5
3
2.5
2
1.5
1
0.5
0
1/12/2012
2/1/2012
2/21/2012
3/12/2012
4/1/2012
4/21/2012
5/11/2012
5/31/2012
6/20/2012
7/10/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Balich Blocks

Date:		1/21/2012			3/25/2012			4/15/2012			6/3/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)	Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DP	2.78	291.55	DP	3.21	310.80	DP	0.48	6.30	DP		
	3-6"	DP	1.32	105.00	DP	1.92	169.40	DP	0.60	12.60	DP		
	6-12"	DP	0.86	48.65	DP	1.17	88.90	DP	0.83	29.75	DP		

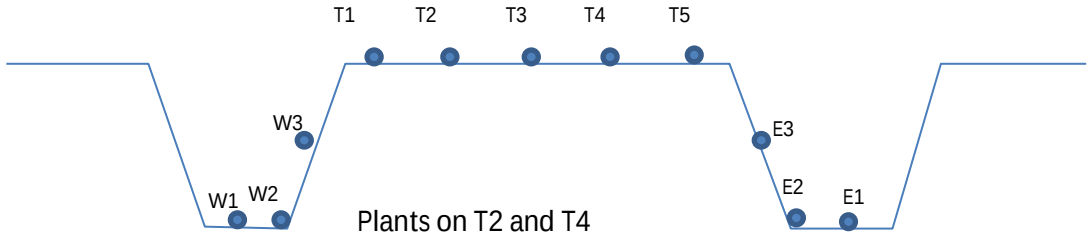
Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

Salinity Data - Top 3 inches

Balich (Uyematsuo)

Using 5TE Sensor and ProCheck

Salinity +8



Balich(25-Mar-12)

Balich	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	5.1	4.4	8.3	5.2	7.7	5.7	3.3	7.8	2.5	6.3	7.6
Temp (F)	66	66	67	67	68	68	67	68	67	68	68
% Moisture	29	26	23	20	23	22	22	21	29	23	20

Balich(15-Apr-12) - 1:15pm

Balich	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	4.7	3.8	2.8	0.7	4.8	5.2	2.4	3.9	4.8	5.9	6.3
Temp (F)	77	78	78	78	77	76	76	76	77	76	75
% Moisture	24	21	20	16	20	22	16	20	25	20	18

Balich(13-May-12) - 1:50pm

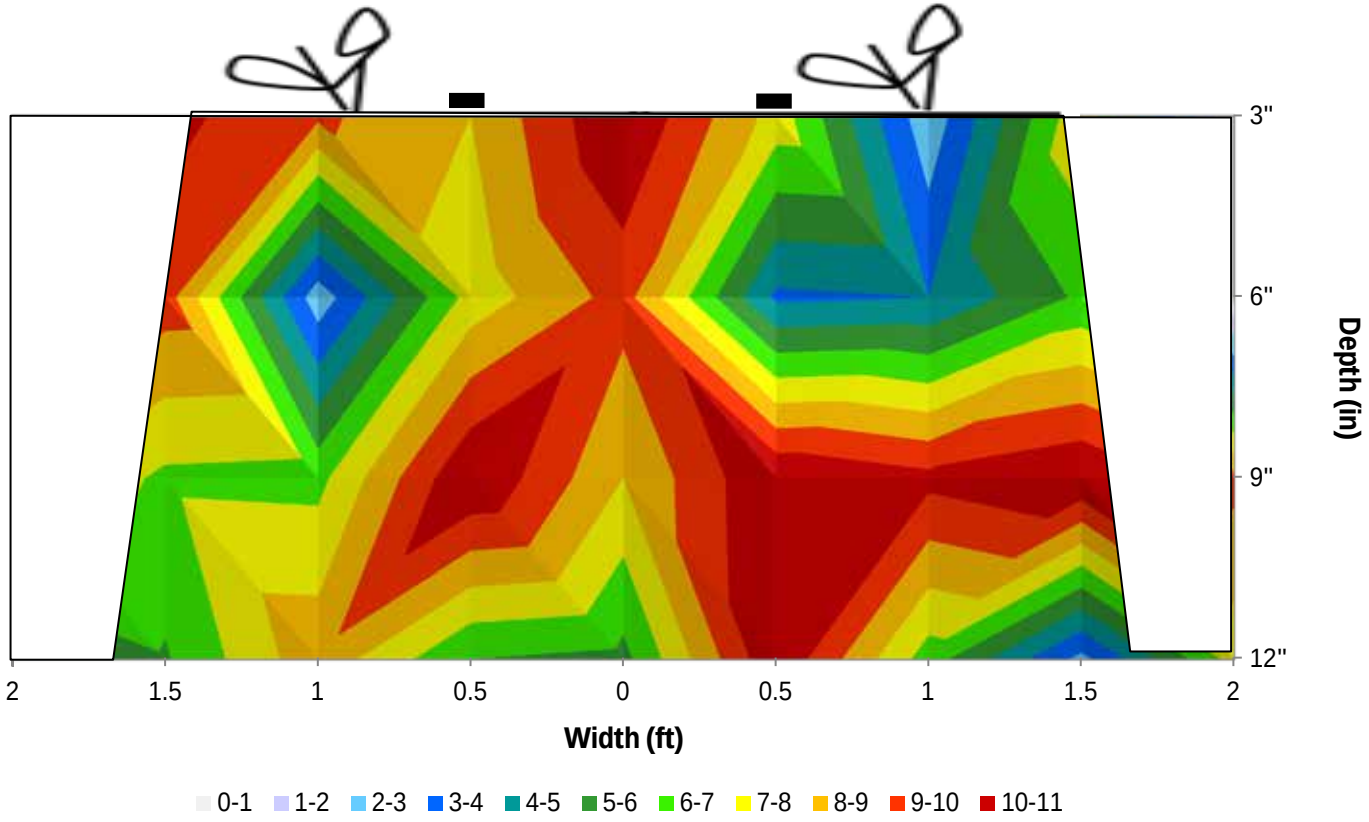
Balich	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	0.3	4.3	1.7	0.8	0.4	0.2	2.5	0.8	4.7	5.3	4.4
Temp (F)	81	80	80	79	78	78	78	77	81	79	77
% Moisture	15	21	16	14	15	17	20	13	23	17	11

Balich(28-June-12) - 1:50pm

Balich	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E1	E2	E3
Salinity (dS/m)	2.2	2.6	4.4	0.4	3.2	6.8	5.6	0.3	0.7	0.0	X
Temp (F)	93	93	93	91	83	81	81	91	91	92	X
% Moisture	26	19	11	19	25	27	24	16	17	20	X

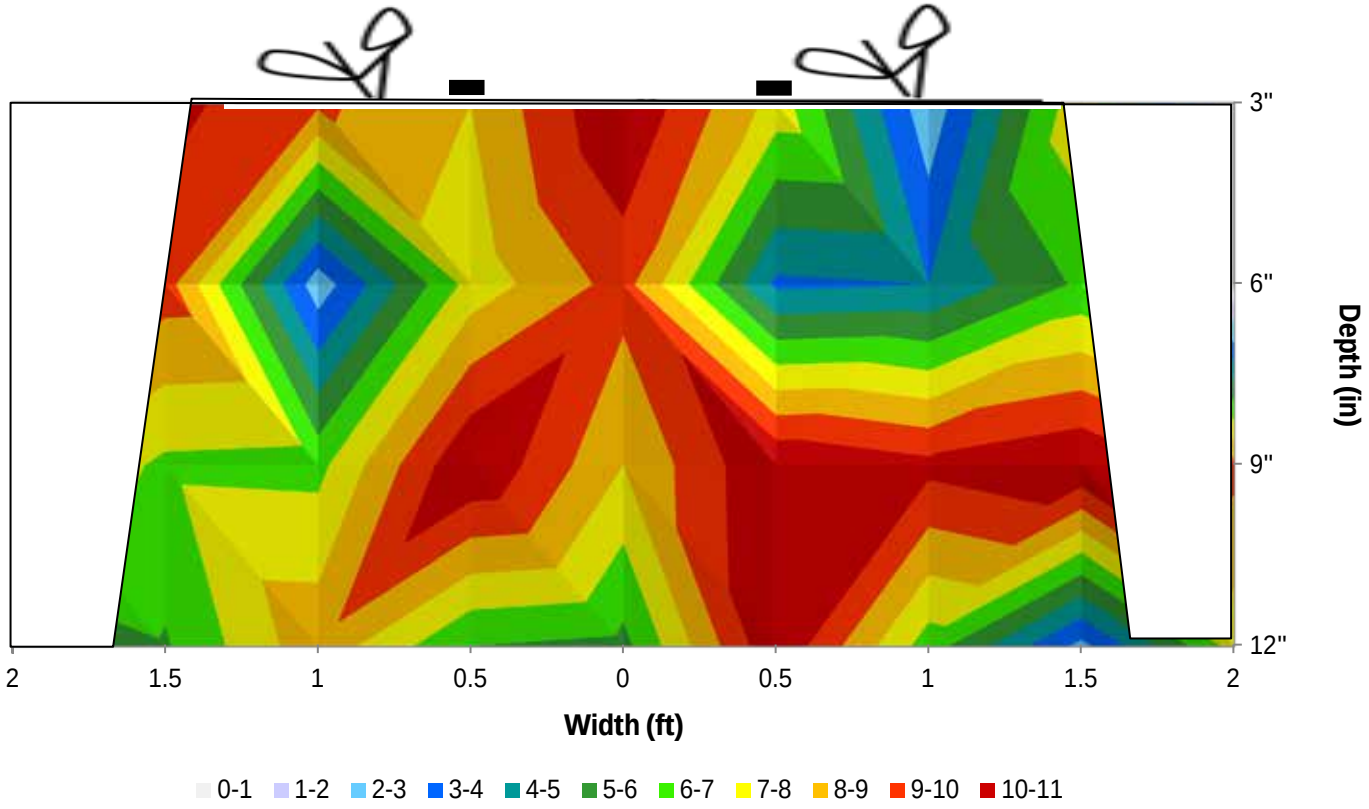
Balich Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 1/22/12

Average EC 7.54 dS/m



Balich Block A Reduced Sprinkler - 2 Tape
EC (dS/m) 6/3/12

Average EC 7.54 dS/m



Anderson

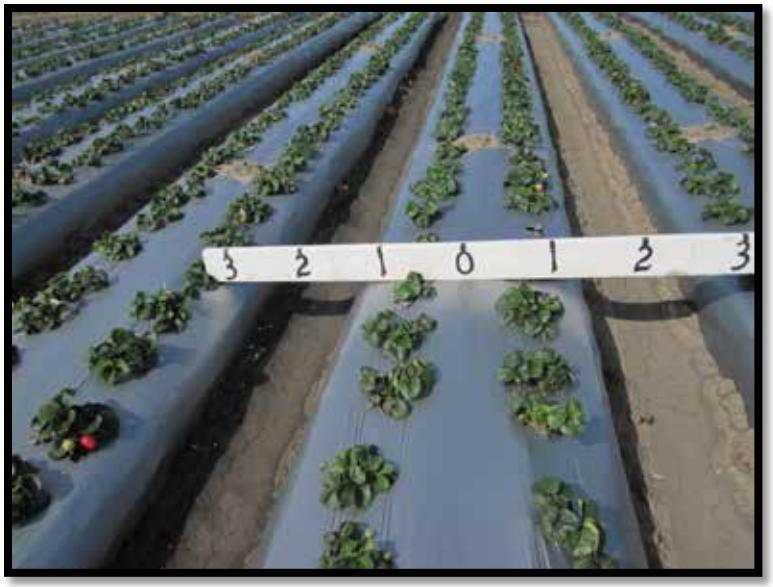
Anderson – Block A

Drip Only

1/15/12 – 10 DAP

2/12/12 – 38 DAP

4/15/12 – 101 DAP



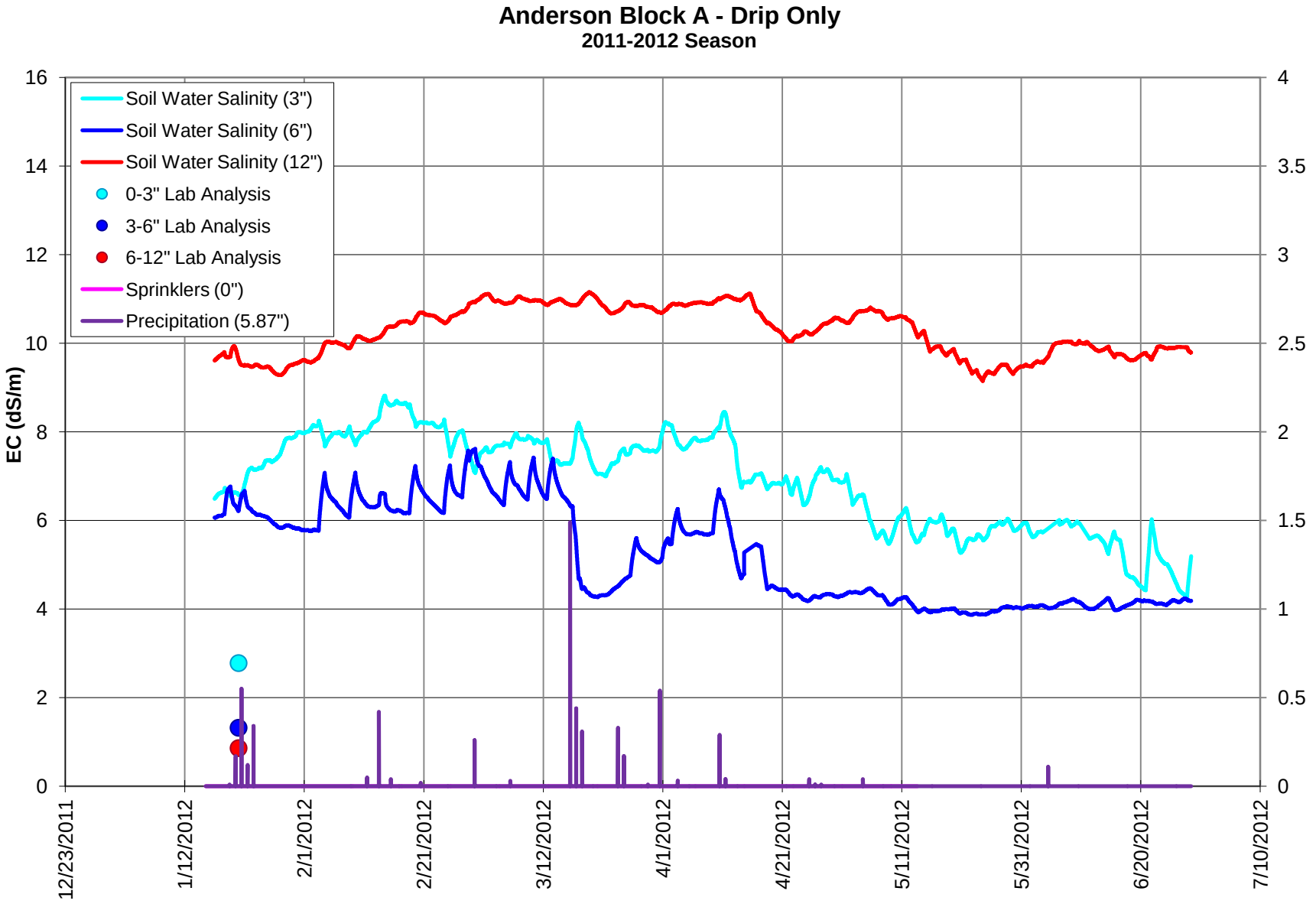
5/13/12 – 129 DAP

Anderson – Block A

Drip Only

6/3/12 – 150 DAP

6/28/12 – 175 DAP


Anderson Block A - Drip Only
2011-2012 Season
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (0")
Precipitation (5.87")
EC (dS/m)
16
14
12
10
8
6
4
2
0
4
3.5
3
2.5
2
1.5
1
0.5
0
12/23/2011
1/12/2012
2/1/2012
2/21/2012
3/12/2012
4/1/2012
4/21/2012
5/11/2012
5/31/2012
6/20/2012
7/10/2012

Evaluation of Modified Drip Irrigation Strategies on Strawberries - Anderson Blocks

Date:		4/15/2012		
		Irrigation Method	ECe Salinity (ds/m)	Chloride (ppm)
Block A	0-3"	DP	3.19	44.10
	3-6"	DP	2.51	21.00
	6-12"	DP	2.64	32.90

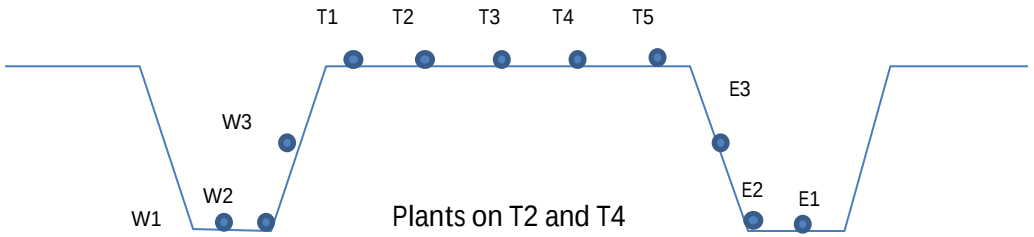
Irrigation Methods: SSS = Solid Set Sprinklers, DP = Drip, DLS = Reduced Sprinkler

Salinity Data - Top 3 inches

Anderson (RAC)

Using 5TE Sensor and ProCheck

Salinity +8



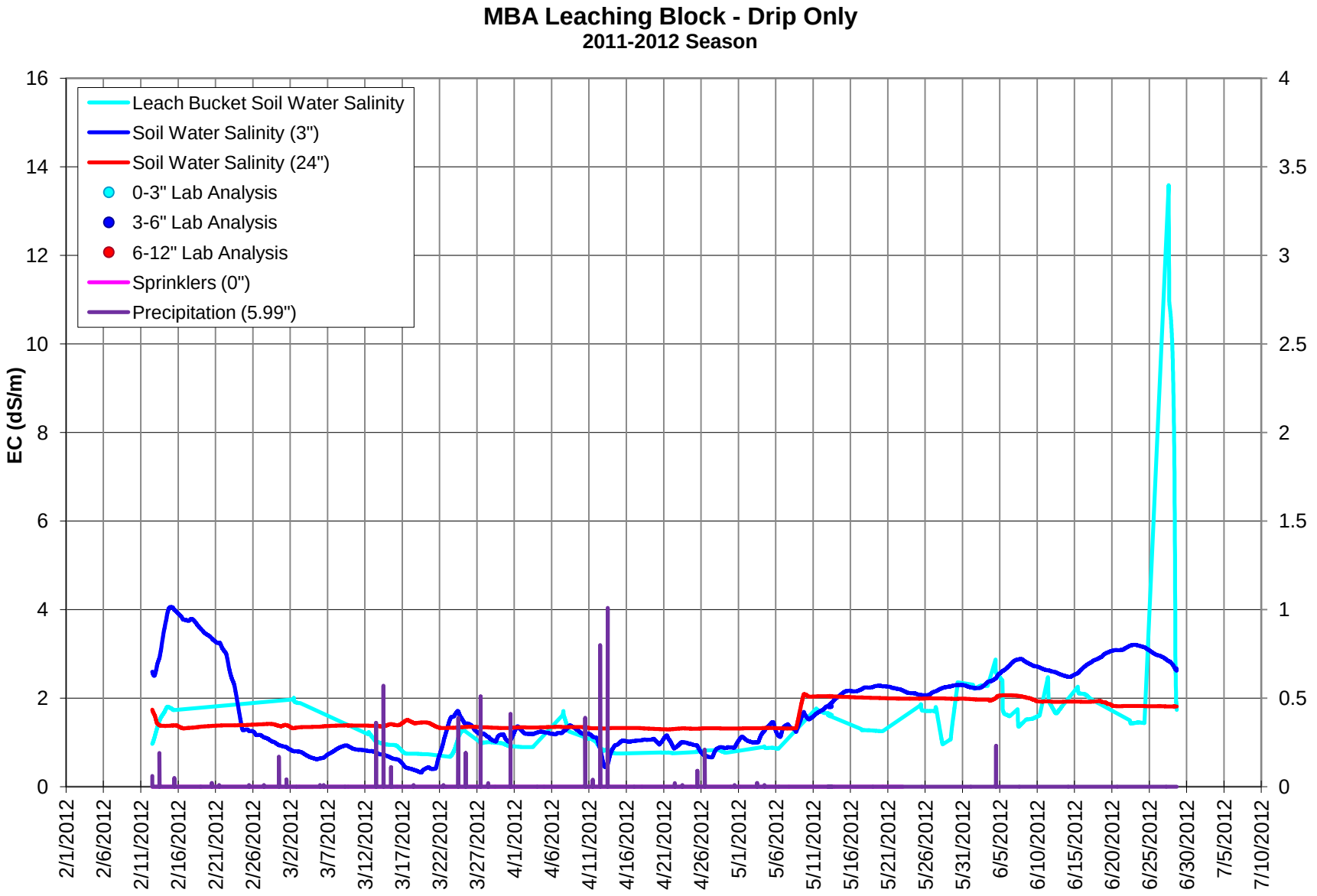
Anderson (15-Apr-12) - 3:40pm

Anderson	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	3.2	1.6	6.0	9.7	7.5	8.5	4.6	7.8	6.1	7.1	5.2
Temp (F)	70	71	71	71	71	70	70	70	70	70	70
% Moisture	23	20	22	17	20	18	19	20	23	22	24

Anderson (13-May-12) - 2:40pm

Anderson	West								East		
	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	0.3	2.2	6.2	7.6	7.8	7.1	4.1	9.3	4.8	0.2	1.7
Temp (F)	81	82	83	81	79	78	77	76	76	75	75
% Moisture	22	21	24	25	25	21	21	27	16	19	20

MBA


MBA Leaching Block - Drip Only
2011-2012 Season
Leach Bucket Soil Water Salinity
Soil Water Salinity (3")
Soil Water Salinity (24")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (0")
Precipitation (5.99")
EC (dS/m)
16
14
12
10
8
6
4
2
0
4
3.5
3
2.5
2
1.5
1
0.5
0
2/1/2012
2/6/2012
2/11/2012
2/16/2012
2/21/2012
2/26/2012
3/2/2012
3/7/2012
3/12/2012
3/17/2012
3/22/2012
3/27/2012
4/1/2012
4/6/2012
4/11/2012
4/16/2012
4/21/2012
4/26/2012
5/1/2012
5/6/2012
5/11/2012
5/16/2012
5/21/2012
5/26/2012
5/31/2012
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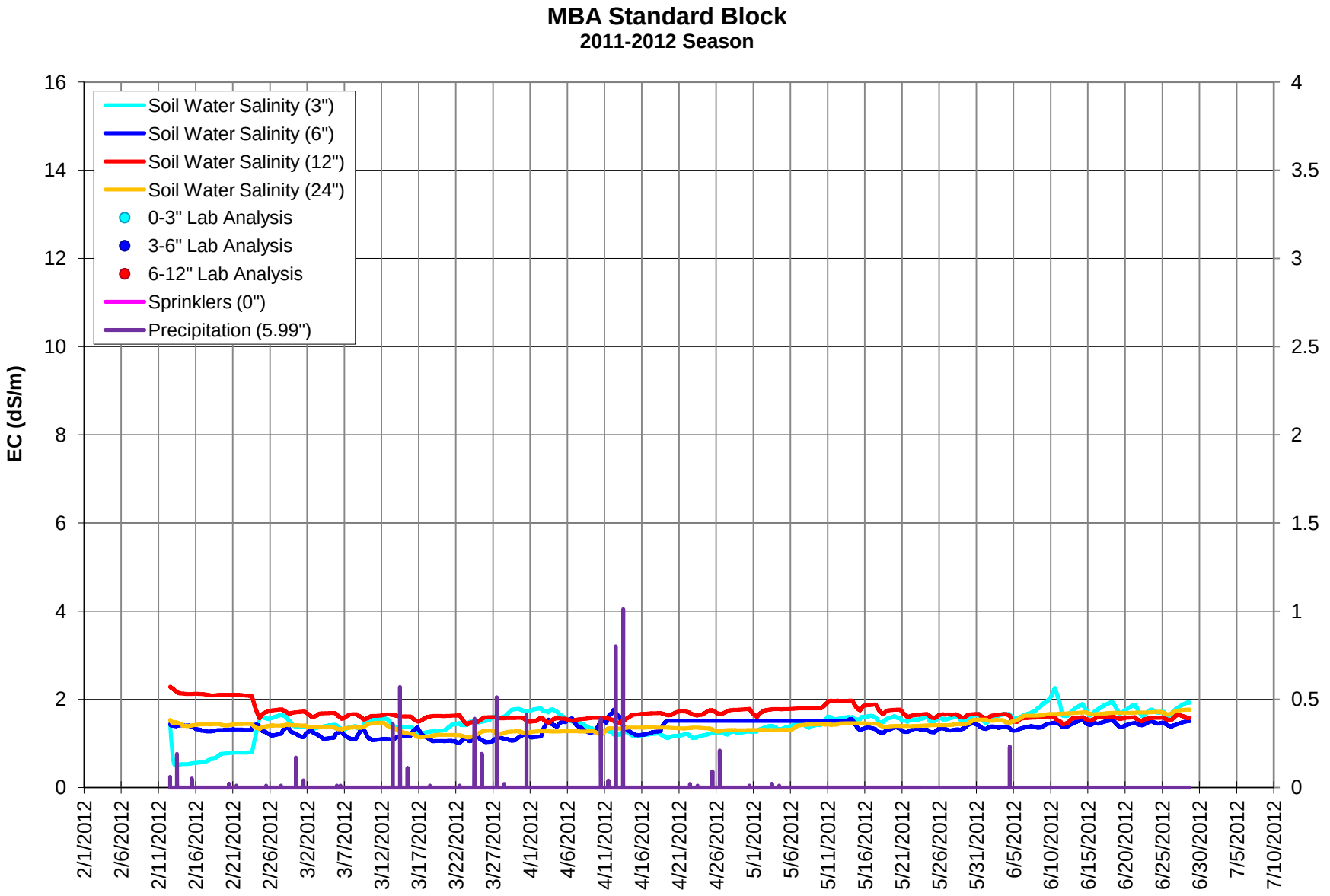
7/5/2012
7/10/2012


MBA Standard Block
2011-2012 Season
EC (dS/m)
Soil Water Salinity (3")
Soil Water Salinity (6")
Soil Water Salinity (12")
Soil Water Salinity (24")
0-3" Lab Analysis
3-6" Lab Analysis
6-12" Lab Analysis
Sprinklers (0")
Precipitation (5.99")
16
14
12
10
8
6
4
2
0
4
3.5
3
2.5
2
1.5
1
0.5
0
2/1/2012
2/6/2012
2/11/2012
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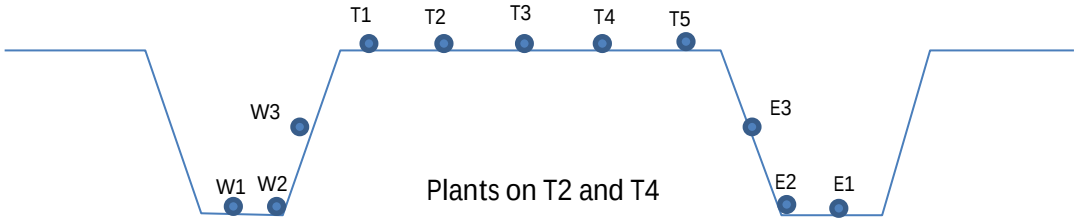
6/10/2012
6/15/2012
6/20/2012
6/25/2012
6/30/2012
7/5/2012
7/10/2012

Salinity Data - Top 3 inches

Using 5TE Sensor and ProCheck

Salinity +8



Bed 1 - MBA - Leach Bed with Logger (25-Mar-12)

MBA	West										East
Comp B1	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	6.5	1.6	2.9	x	0.2	3.9	0.7	x	1.5	2.3	2.9
Temp (F)	66	65	62	x	60	61	61	x	62	62	61
% Moisture	21	22	22	x	23	25	22	x	21	27	24

Bed 2 - MBA - Standard Bed with Logger (25-Mar-12)

MBA	West										East
COIR Red	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	0.9	0.5	1.9	1.3	0.5	2.6	1.3	2.2	1.8	2.1	2.8
Temp (F)	59	59	58	58	58	58	58	59	59	60	60
% Moisture	19	21	23	23	21	16	18	13	24	22	22

Bed 1 - MBA - Leach Bed with Logger (15-Apr-12) ~ 11:45am

MBA	West										East
Comp B1	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	2.4	1.8	1.8	x	1.2	0.6	0.2	x	3.2	2.2	4.6
Temp (F)	73	73	72	x	70	69	69	x	68	67	66
% Moisture	17	23	27	x	21	40	29	x	23	19	17

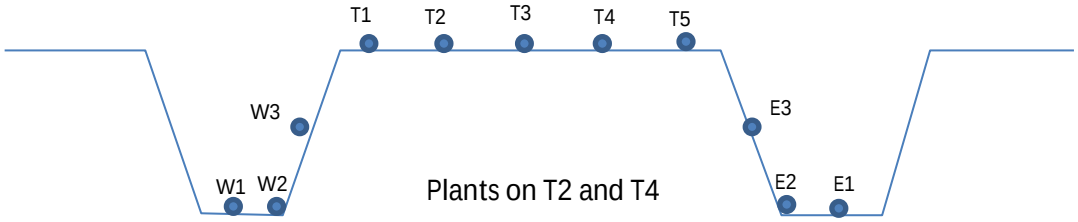
Bed 2 - MBA - Standard Bed with Logger (15-Apr-12) ~ 11:45am

MBA	West										East
COIR Red	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	2.4	1.1	1.2	1.5	1.3	3.9	1.8	2.9	1.4	1.7	4.5
Temp (F)	68	68	68	66	66	66	66	66	68	69	69
% Moisture	17	17	26	25	21	12	17	17	23	20	17

Salinity Data - Top 3 inches

Using 5TE Sensor and ProCheck

Salinity +8



Bed 1 - MBA - Leach Bed with Logger (13-May-12) ~ 12:20pm

MBA	West										East
Comp B1	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	1.6	2.5	1.8	x	3.2	3.7	4.9	x	3.0	2.7	3.7
Temp (F)	70	69	69	x	68	67	67	x	67	68	68
% Moisture	20	22	30	x	28	25	23	x	26	25	16

Bed 2 - MBA - Standard Bed with Logger (13-May-12) ~ 12:40pm

MBA	West										East
COIR Red	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	x	1.7	1.3	0.8	0.8	0.7	1.5	0.8	0.8	1.6	x
Temp (F)	x	70	70	74	73	73	72	72	72	72	x
% Moisture	x	13	25	23	17	15	15	17	25	25	x

Bed 1 - MBA - Leach Bed with Logger (3-June-12) ~ 12:30pm

MBA	West										East
Comp B1	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	x	1.8	2.0	x	2.8	3.7	5.3	x	2.6	4.4	x
Temp (F)	x	90	87	x	85	85	84	x	82	82	x
% Moisture	x	20	27	x	25	25	24	x	26	22	x

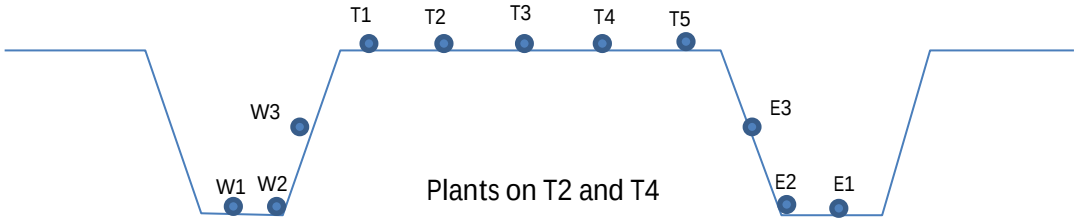
Bed 2 - MBA - Standard Bed with Logger (3-June-12) ~ 12:45pm

MBA	West										East
COIR Red	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	x	1.1	2.3	0.5	1.3	0.3	1.9	1.2	2.2	1.9	
Temp (F)	x	85	84	85	84	86	83	83	84	84	x
% Moisture	x	14	18	17	20	16	16	21	23	23	x

Salinity Data - Top 3 inches

Using 5TE Sensor and ProCheck

Salinity +8



Bed 1 - MBA - Leach Bed with Logger (28-June-12) ~ 5:30pm

MBA	West										East
Comp B1	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	X	1.5	2.6	2.2	1.0	1.0	1.4	4.3	X	2.1	1.9
Temp (F)	X	89	89	89	87	87	84	83	X	84	83
% Moisture	X	25	22	21	24	28	20	11	X	24	20

Bed 2 - MBA - Standard Bed with Logger (28-June-12) ~ 5:45pm

MBA	West										East
COIR Red	W1	W2	W3	T1	T2	T3	T4	T5	E3	E2	E1
Salinity (dS/m)	1.9	0.8	1.4	1.8	1.5	1.1	2.8	2.0	1.8	1.5	0.9
Temp (F)	79	80	81	82	82	81	79	79	81	80	80
% Moisture	11	20	22	20	18	16	18	17	18	25	19